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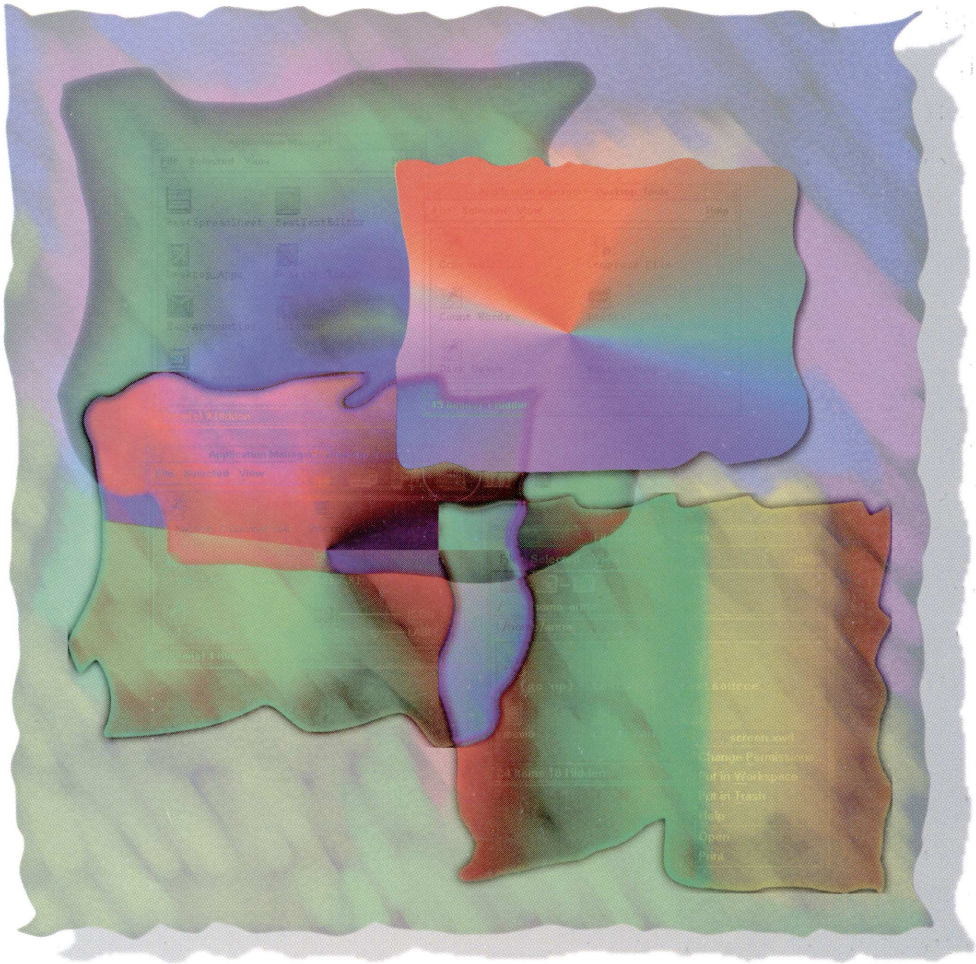

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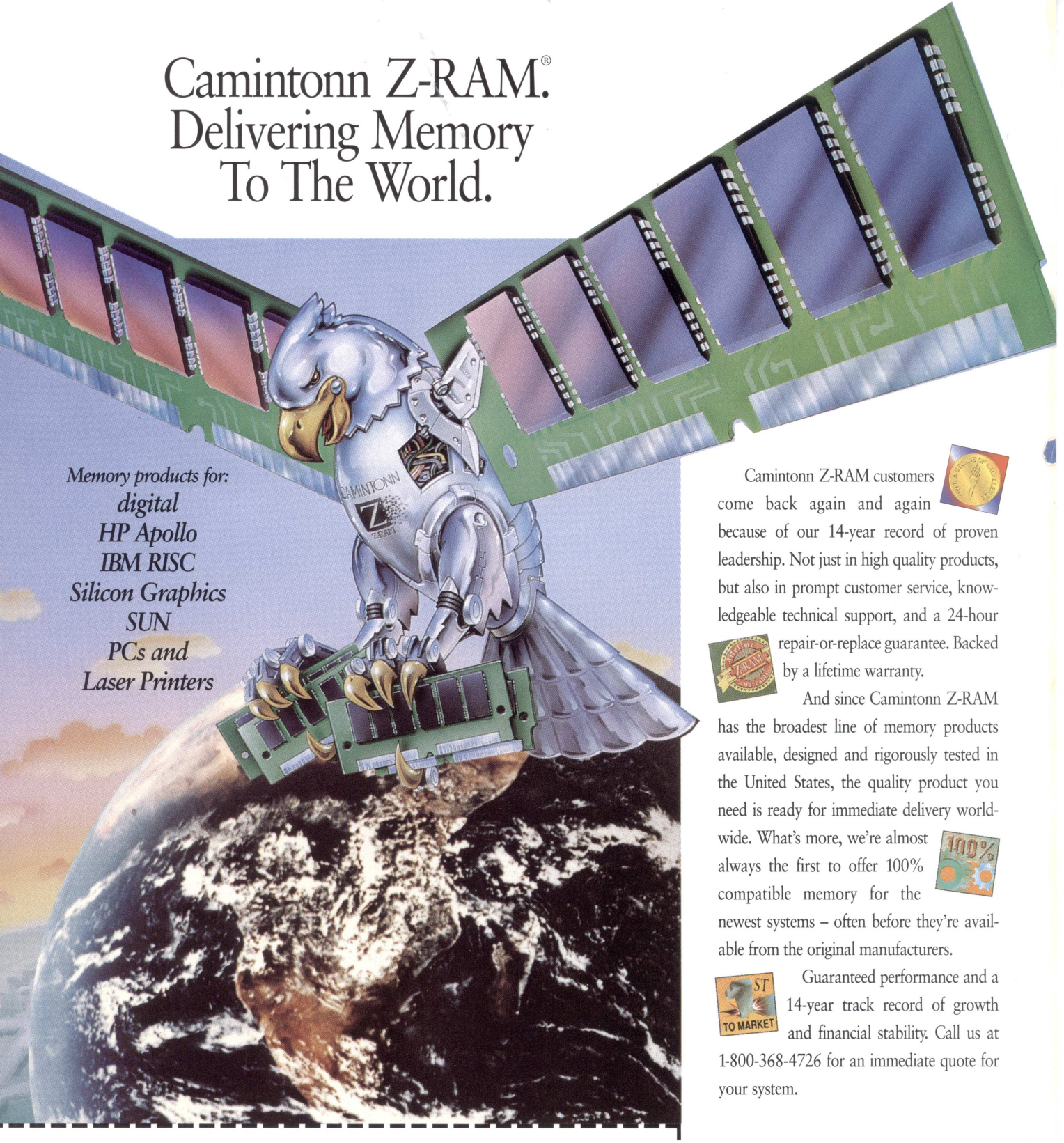

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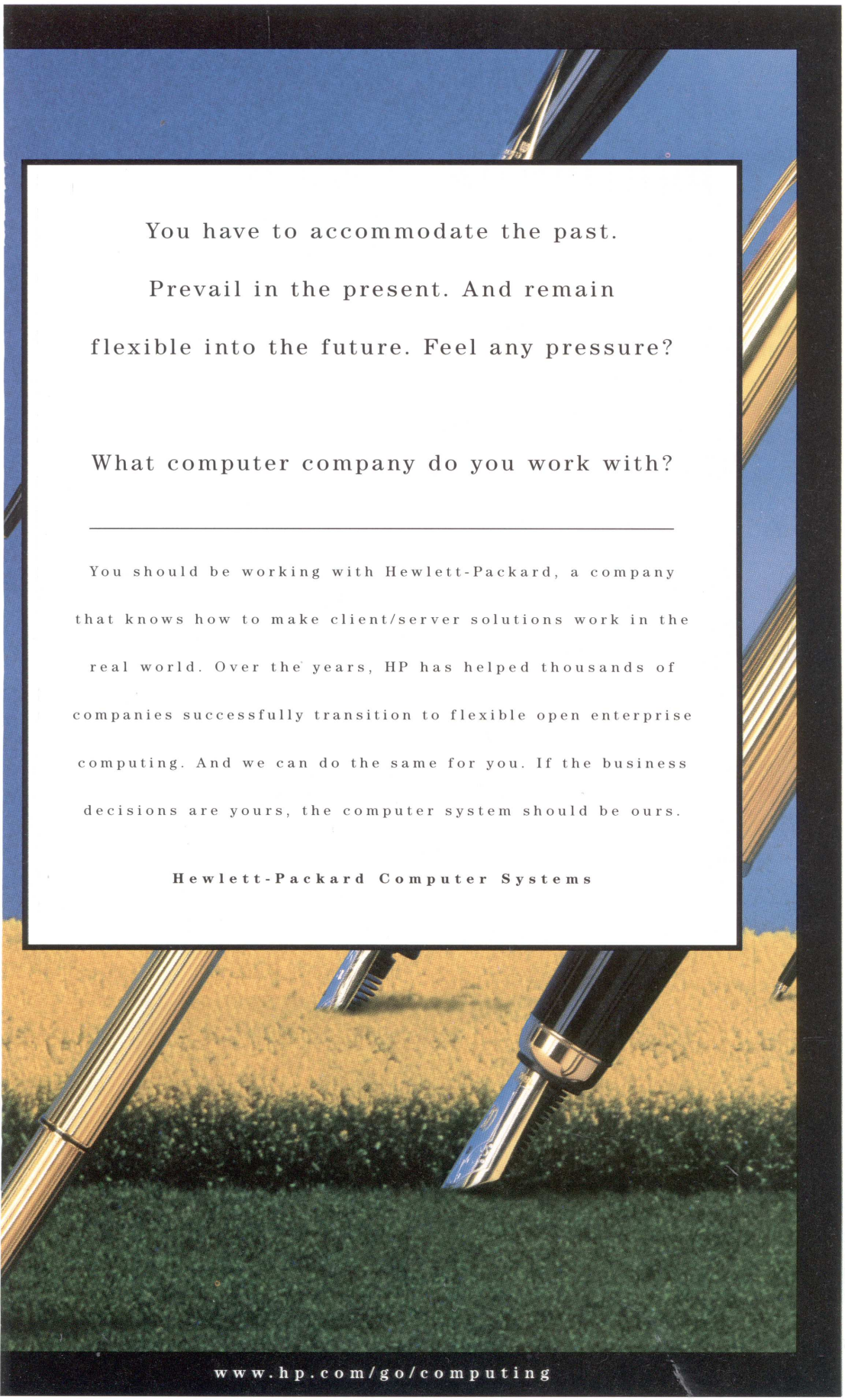

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Volume 4, Number 3 May 1996

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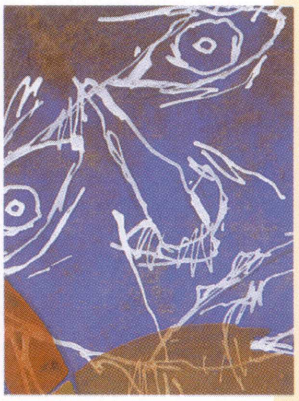

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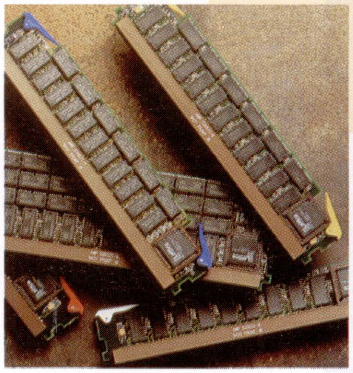

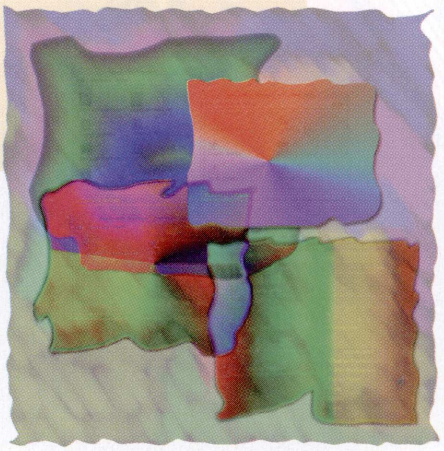

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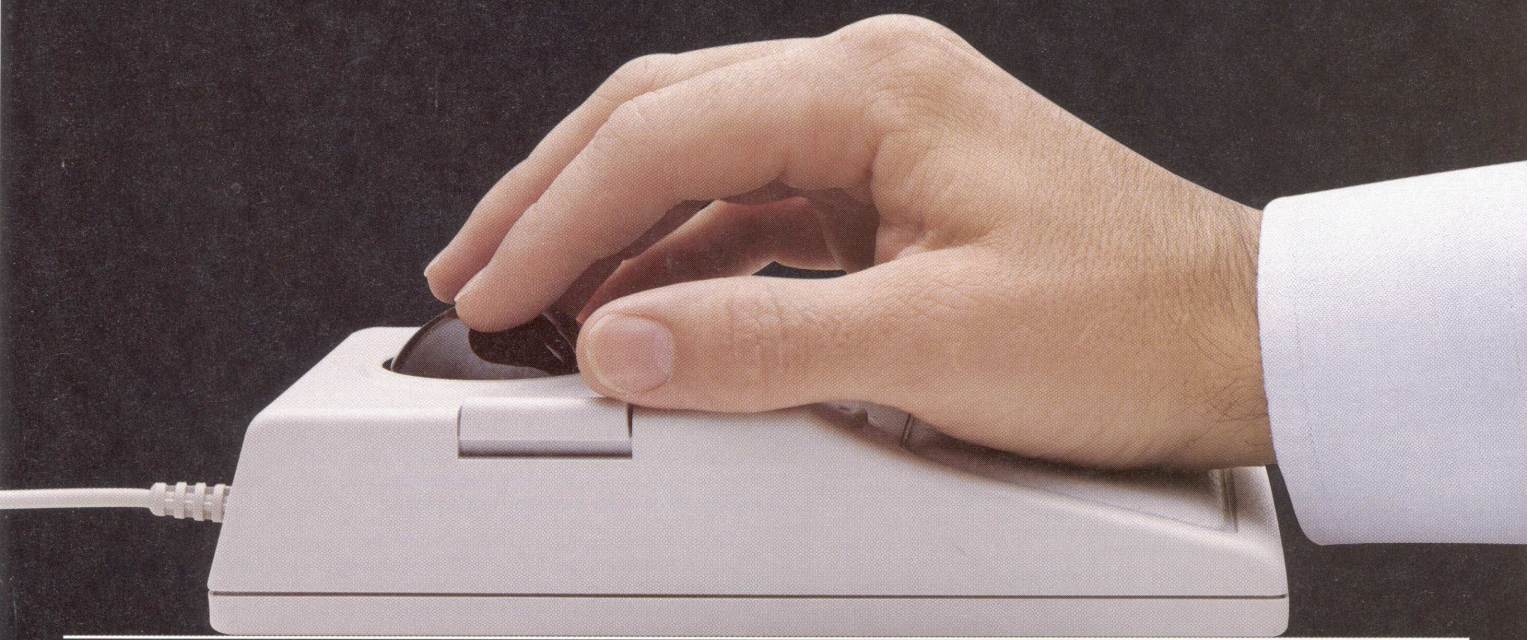

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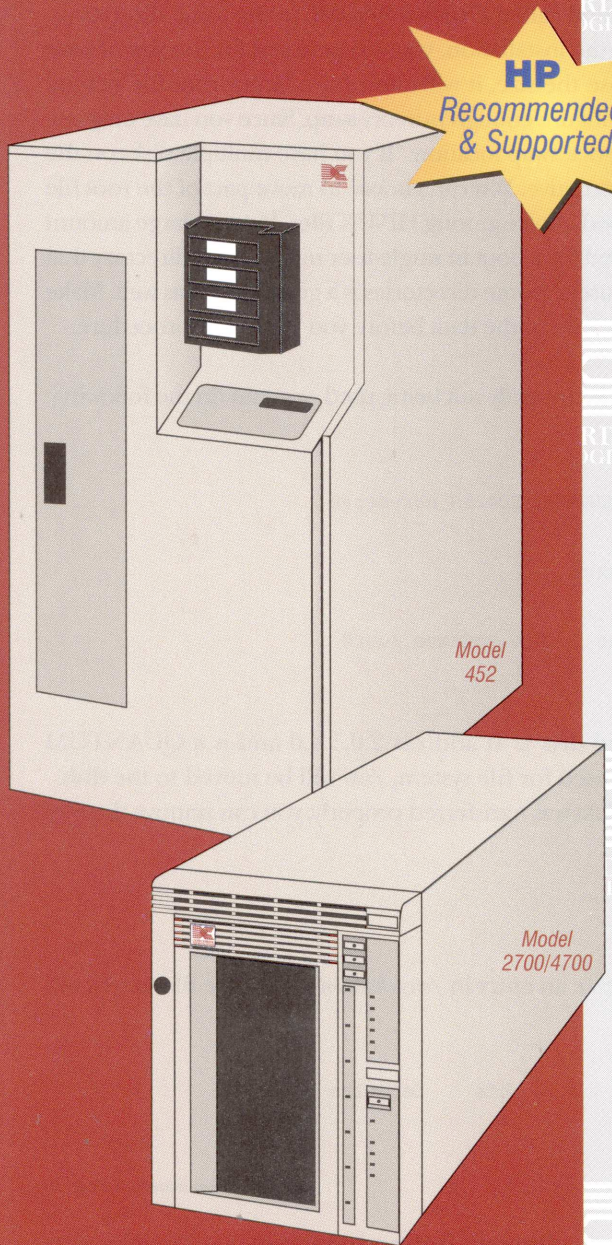

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Question & Answer

Q: I have an HP 9000 Series 715 running HP-UX 9.03. My root disk is a QUANTUM LPS525S, which is 511,742 kilobytes in size. After some changes to my environment, I need to increase the size of my root file system. How can this be done?

A: You cannot increase the actual size of the root file system on this disk without a reinstall. There is no way to expand the file system. If the root disk is the only disk on your system, you have two alternatives:

- Clean up the file system to improve the disk space. This can be achieved by trimming log files, removing core files, and removing large files that are no longer needed on the system. You may want to try using the utility */system/TOOL/FreeDisk*. There is a readme file included called *FreeDiskREADME* in the same directory.
- Reinstall the system. During the installation, you will be asked for the size of your primary swap. If you decrease the size, it will allow for a larger root file system. However, be sure that you configure enough primary swap. Since you have only one disk, this will be your only device swap location. If you have multiple disks on the system, you have another alternative. You can choose to move part of the root file system elsewhere. */usr* is a good choice among HP-UX files. It uses a large amount of disk space and is not needed for a boot in single-user mode. A subdirectory that contains application data or users' home directories is a good choice as well. Make sure that you have a good backup of the data before you begin any procedure.

  If you have another disk that is currently not being used, you can do the following:

```
# shutdown 0
# newfs /dev/rdsk/c201d4s0 QUANTUM_PD425S_noreserve
# mkdir /usr2
# mount /dev/dsk/c201d4s0 /usr2
# cd /usr
# find . -hidden -depth -print | cpio -pduxvm /usr2
# du -s /usr /usr2
```

In this example, the unused disk is at address 2.0.1.4.0 and is a QUANTUM PD425S. All of the disk will be used for file system. */usr* will be moved to the disk.

When you are sure that the data was transferred properly, you can remove the files under */usr*.

```
# rm -r /usr/*
```

At this point, you need to create an entry in */etc/checklist* so that the file system will be mounted on boot:

```
/dev/dsk/c201d4s0    /usr            hfs     defaults  0 2
```

Test with a reboot.

Continued on Page 10

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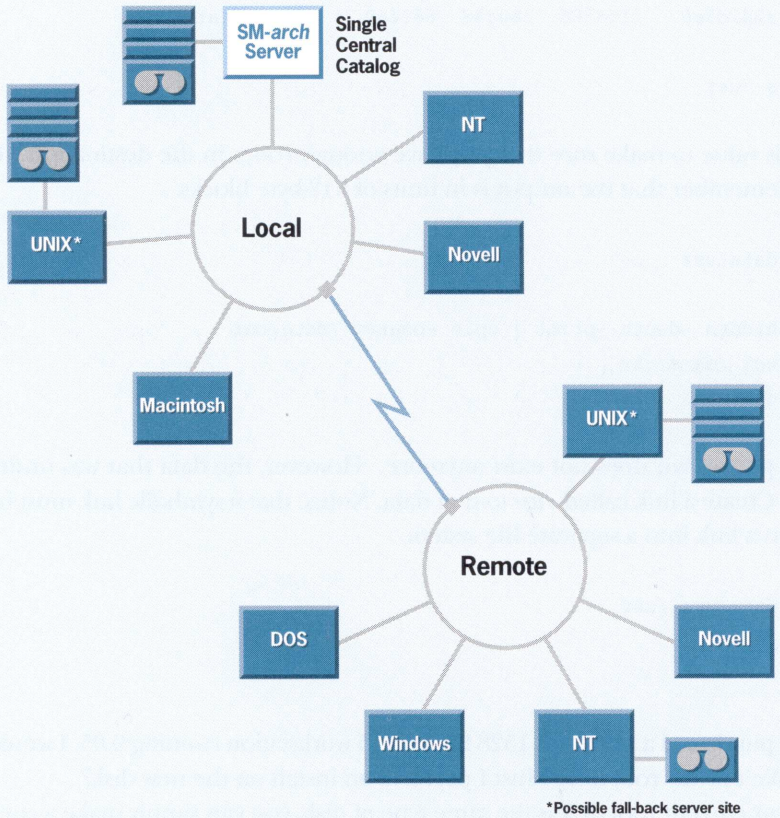

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```
# shutdown -r0
```

A second scenario is that you do not have an unused disk, but you do have a file system that has a great deal of free disk space.

```
Filesystem           kbytes    used   avail capacity Mounted on
/dev/dsk/c201d3s0    1156586  380458  660469    37%   /data
```

```
# du -s /usr
```

Use this value to make sure that you have enough room in the destination file system. Remember that the output is in units of 512-byte blocks.

```
# mkdir /data/usr
# cd /usr
# find . -hidden -depth -print | cpio -pduxvm /data/usr
# du -s /usr /data/usr
# rm -r /usr
```

At this point, */usr* does not exist anymore. However, the data that was under */usr* does. Create a link called */usr* to that data. Notice that a symbolic link must be used as it is a link into a separate file system.

```
# ln -s /data/usr /usr
```

Q: I just purchased a MICROP 1528 for my 715 workstation running 9.05. I would like to make this my root disk. Must I perform an install on the new disk?

A: If your current root disk is the same type of disk, you can simply make a copy of the disk using *dd(1)*. However, do *not* use this command if different disk types are involved. If you do, you will effectively waste space on the new disk or use a file system structure that is not optimal for the new disk. This command can also be used for copying non-root disks as well. For example, if the new disk is at address 2.0.1.5.0, issue this command:

```
# dd if=/dev/rdsk/c201d6s0 of=/dev/rdsk/c201d5s0 bs=64k
```

If your current root disk is not a MICROP 1528, then you can follow a series of steps to avoid an installation. First, you must decide how much primary swap you want on the new disk. This means you must select an appropriate disktab entry. Let's say you would like to have 200 megabytes.

```
# newfs /dev/rdsk/c201d5s0 MICROP_1528_200MB
# mkboot -s 700 -v /dev/rdsk/c201d5s0
```

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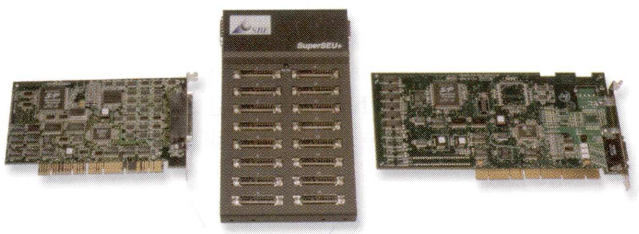

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```
# mkdir /newroot
# mount /dev/dsk/c201d5s0 /newroot
# cd /
# find . -hidden -depth -xdev | cpio -pduxvm /newroot
```

If you plan to move the new disk to the current address of your root disk, nothing more need be done. However, if you plan to keep the disk at its current address, you must change a couple of things. First, */newroot/etc/checklist* must be changed to allow for the proper mounting of /. Change the first field of the entry for / to the device file for the new disk.

```
/dev/dsk/c201d6s0   /      hfs    defaults  0 1
```

will become

```
/dev/dsk/c201d5s0   /      hfs    defaults  0 1
```

Secondly, if you want the system to boot automatically off the new disk, you must change the primary boot path of the system. You can do this by booting the system in attended boot mode.

Q: What is dynamic buffer cache and should I be using it? How do I tell if I am using it already?

A: Dynamic buffer cache exists on the 700 workstations at 9.X and continues to exist at 10.X in a slightly different form. Buffer cache is a portion of physical memory that is dedicated to file system I/O. All I/O to file systems goes through the buffer cache. It allows for the possibility of read and write requests being satisfied without the need for actual disk access. This can be extremely beneficial in some situations.

The size of the buffer cache can be static or dynamic. There is an internal algorithm that controls the dynamic nature of the buffer cache. During high file system I/O activity, the size of the buffer cache will increase. As the I/O begins to subside, the size will decrease. HP has released a patch that limits the increase to 50 percent of your RAM.

There is a kernel parameter that controls this characteristic of the buffer cache. It is called *bufpages*. If *bufpages* is set to zero, dynamic buffer cache will be used. If *bufpages* is greater than zero, a static size will be used that is based on that value. The value is in units of 4 kilobytes.

You can use sam to determine the value of *bufpages* on your system. Another way is to issue the following command at the command line.

```
# echo "bufpages?D" | adb /hp-ux /dev/kmem
```

The value of *bufpages* on disk (in the file */hp-ux*) will be displayed. If the value is zero, the size of your buffer cache will vary. You can find the current size of your buffer cache by using Glance, a performance analysis tool. Another method is to check the value of *bufpages* in memory. Remember, you have a version of the kernel on disk and an executing copy of *hp-ux* in memory.

```
# echo "bufpages/D" | adb /hp-ux /dev/kmem
```

Compare that to the amount of physical memory on your system.

```
# echo "physmem/D" | adb /hp-ux /dev/kmem
```

Only you, after consulting with your application vendors, can decide what type of buffer cache to use. If your I/O is fairly consistent on the system, you may want to use a static value. However, it is difficult to determine what that static size should be. When you increase the size of your buffer cache, you are lessening the amount of memory that can be used for running processes. As a result, it is possible to induce paging on the system. On the other hand, a buffer cache that is too small could result in excessive disk access.

Q: I have just added a Seagate ST31200N to my HP 9000 735. I will be using this disk for file system and swap. I have been directed by one of my application vendors to add 240 megabytes of additional swap. I can't find a disktab entry to fit my needs. How can I create my own disktab entry?

A: HP has provided a variety of disktab entries for supported disks. In most cases, the available choices satisfy configuration requirements. If this is not the case, you can create a disktab entry based on existing entries. The first section of */etc/disktab* gives a good deal of information about creating your own disktab entry.

Let's first look at the "no swap" entry for your disk drive.

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```
SEAGATE_ST31200N_noswap|SEAGATE_ST31200N_noreserve:\
        :No swap or boot:ns#38:nt#13:nc#2075:\
        :s0#1025050:b0#8192:f0#1024:\
        :se#512:rm#5400:
```

Most likely, you will want the block size, *b0*, and the fragment size, *f0*, to remain the same. You will want to keep the number of sectors per track, *ns*, and the number of tracks per cylinder, *nt*, the same as well. These are values that HP has deemed optimal for this disk and consequently they are used in the supported disktab entry. The value that will be changed, however, is the number of cylinders, *nc*. You will need to reduce that to reduce the size of the file system. Since the following relationship must hold true:

```
s0 = ns * nt * nc
```

you must decrease *nc* to decrease *s0*, which is the size of the file system. The amount of swap on the disk is decided by the size of the file system. The disktab entry above allows no room for swap.

First, subtract 240 megabytes from the *s0* value. That equates to about 779,290 kilobytes. Then, divide that by (*ns* * *nt*). That would equal about 1,577. That should be the value of *nc*. To get the new *s0* value, multiply *ns*, *nt*, and *nc*.

```
nc = (s0 - <size of swap>) / (ns * nt)
s0 = ns * nt * nc
```

The new disktab entry is :

```
SEAGATE_ST31200N_noswap|SEAGATE_ST31200N_noreserve:\
        :No swap or boot:ns#38:nt#13:nc#1577:\
        :s0#779038:b0#8192:f0#1024:\
        :se#512:rm#5400:
```

Questions are answered by Susan Potter, an HP-UX System Support engineer at the HP Atlanta Response Center. E-mail: sup@atl.hp.com.

HP-UX Systems Administration

by Chris Curtin

Tracking Last User Logins

THIS MONTH I PRESENT A script for displaying information about user logins.

This script displays the following:

- Last Successful User Login
- Last Unsuccessful User Login
- Last Successful User Login via Modem
- Last Successful User Login via an X Terminal

But first I need to warn you of a possible security hole in HP-UX.

/tmp Permissions

By default Hewlett-Packard sets the permissions on the */tmp* directory to `drwxrwxrwx`, which basically means that anyone can do anything in the directory. This is dangerous because of the many temporary files, recovery files, named pipes, UNIX Sockets, and log files that get written to this directory.

One way of making */tmp* a little more secure is to set the 'sticky-bit' or 'save-text' bit in its permission. Normally the sticky-bit tells HP-UX to leave the program that has the bit set in memory between invocations. (Even though that is what the bit is for, HP-UX seems silently to ignore it.)

What setting the sticky bit on a directory does is change who can delete or rename a file. If you are not the owner of the directory, the owner of the file, or root, you cannot rename or delete the file.

To change the permission on */tmp* (and probably */usr/tmp* also) execute the following:

```
chmod +t /tmp
```

as root.

Note that the */etc/update* program removes the sticky-bit from the */tmp* directory each time it is run, so you'll have to set it back when you are done using */etc/update*.

LastLogin Script

When I was in college, at UMASS-Amherst, we did all of our work on VAX VMS and Ultrix systems. One very nice feature of both of these operating systems was that they told you the last time of your successful and unsuccessful loggins.

When I moved to HP-UX about 10 years ago, I noticed that there was no similar feature. I then promptly forgot about it. That changed this past February when a user of the HP-UX System Administration mailing list asked how to implement similar functionality for HP-UX. I sat down and wrote the script in *Listing 1*.

I then went out of town for a couple of weeks and never sent it to the person asking the question ;-). Luckily someone else had the same idea and was able to help the person.

Basically, what this script does is use the */etc/last* and */etc/lastb* commands to determine when a user logged in last. This version also tells the user the last time he or she logged in via modem or X Terminal. The modem field is very important if someone who should not be is using an account from an external location.

First I use the */etc/lastb* command to find the last unsuccessful login by the user. Note that the */etc/lastb* command, when used with a user name, matches only logins that failed because of passwords.

If the user meant to log in as "edward" and typed "edword," this command will not catch it. This is why I recommend a nightly or weekly *cron* task

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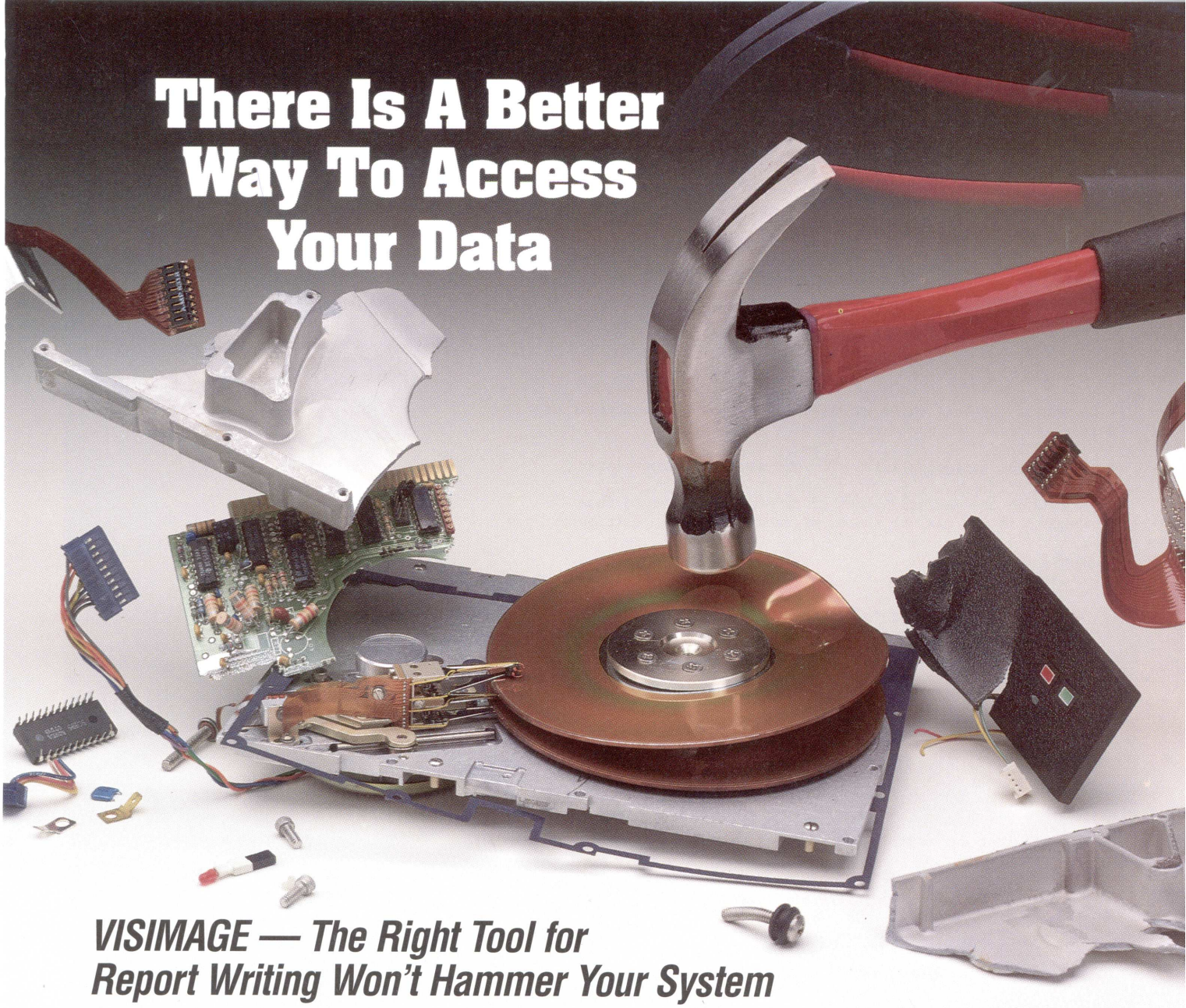

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LISTING 1 *User Logins*

```
#!/bin/ksh
#
# Determine the last valid and invalid logins for the current user
# Requires that /etc/btmp exist.
#
#  Define some variables which we might want to changed later
#
#  MaxBad is the maximum number of bad login entries to show
#  MaxGood is the maximum number of successful login entries to show
#
MaxBad=1
MaxGood=2
#
#  Now get the last bad information.
#
BadLogin=`/etc/lastb -$MaxBad $USER`
if [ -z $BadLogin ]
then
  echo "No Unsuccessful Login History."
else
  echo "Last Bad Login:"
  echo $BadLogin
  echo ""
fi
#
#  Now the last successful Information
#
GoodLogin=`/etc/last -1 $USER`
GoodModem=`/etc/last $USER | grep ttyd | head -1 -n 1`
#
#  Assumes that all X terminals contain 'xterm' in the name
#
GoodXTerminal=`/etc/last $USER | grep xterm | head -1 -n 1`
#
if [ -z $GoodLogin ]
then
   echo "No Successful Login History."
else
   echo "Last Login:"
   echo $GoodLogin
   echo "Last $MaxGood Logins:"
   /etc/last -$MaxGood $USER
fi
#
if [ -z $GoodModem ]
then
   echo "No Modem Login History."
else
   echo "Last Successful Modem Login:"
   echo $GoodModem
fi
#
if [ -z $GoodXTerminal ]
then
   echo "No X Terminal Login History."
else
   echo "Last Successful X Terminal Login:"
   echo $GoodXTerminal
fi
```


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which reports all bad logins to root user.

Next I use the */etc/last* command to report the last unsuccessful login and the last two successful logins. Reporting the last two successful logins allows the user to think if he was logged in at that time and, if not, to change his password and alert the security officials since the account may have been compromised.

The last two pieces of data supplied to the user are the last successful modem and X Terminal logins. I added this data because of my user base.

The majority of my users use the X Terminal as their primary interface to the system; however, several use PCs running Windows and a Telnet script to log in. If one of the PC users sees that his account was logged in from an X terminal, then he knows his password has been compromised.

The same logic applies to the modems. If a user doesn't remember logging in via modem (or doesn't own a modem), then we need to investigate. This strategy puts some security checks into the hands of the users, who see the information every day, and may help detect break-ins faster.

One thing to note about this script: if the user has never had an unsuccessful login attempt or never logs in via modem or X terminal, a message about not having any History is displayed. Also, the */etc/last* and */etc/lastb* programs use the contents of the */etc/wtmp* and */etc/btmp* files. Since these files grow without bound (unless trimmed) the commands may take several seconds. If the files have been trimmed, the data may not be available to provide to the user.

For example, if the last unsuccessful login was 45 days ago, but the log file scripts keep only 30 days of data, this script will report no history of unsuccessful logins. See my September 1995 column for a system that maintains the login log files and others.

Internet Resources

I recently signed up with a local Internet provider and have a direct Internet account. One of the first things I did was go to the Yahoo search engine and see what I could find relating to HP-UX. While the Internet Goodies column by Joseph Berry in this magazine covers the general Internet, I'll be occasionally reporting system administration related sites I have found.

Besides the usual HP stuff (*www.hp.com*, etc.) I found a U.S. link to the Liverpool Software Porting Archive (*http://hpux.cae.wisc.edu*). This site contains public domain software ported and tested on HP-UX. A quick look at the contents showed all the X Window stuff HP did not ship in 8.x and 9.x and a section devoted to system administration utilities. They also have a mailing list that will notify you when additional packages are added to the archive or updated. (See the Web page for more details.)

The next site I found contains all the HP-UX 10.X release notes in HTML format (*http://arpf.arl.mil/tworks/archives/10.0_wp.html*). I looked through them and they seem to be the ones HP provides.

The last site I'll mention this time is the UNIX Guru Universe (*http://www.polaris.net/ugu*). As the name implies, this is a Web site dedicated to UNIX administration. I just found this site a couple of days before writing this column, but I'm sure I'll have lots to write about for the next column.

In addition to the standard Usenet news groups like *comp.sys.hp** and *comp.unix.admin*, I found a great group where System Administrators can vent their frustrations: *alt.sysadmin.recovery*. It is a great place for an admin to vent the silly and stupid things users have done or management has ordered them to do. No technical content, but it makes you fell better knowing that you are not alone.

Cool Stuff

For my birthday last year my daughter gave me a great t-shirt. It says "System Administration: It's a dirty job, but someone said I have to do it." It is from the publisher of *SysAdmin* magazine and can be ordered by calling (913) 841-1631. I have no connection with *SysAdmin* magazine—I just think it is a great t-shirt. (I suspect that my wife helped pick it out because my daughter was 11 months at the time.)

I wore the shirt while on a tour of the Napa, California area and had about a dozen people stop me and either ask where I got it or what systems I worked with. My bosses thought it was funny too.

Well that's it for this time. Now that I have a better Internet connection I'm looking for sites to check out. Send me your comments and suggestions for columns to the address below. ◧

Chris Curtain, a software developer for Bradley Ward Systems, Inc. in Atlanta, Georgia, specializes in device driver development for factory automation on the HP 9000. He can be reached via e-mail at: chris@bwilab3.atl.ga.us.

#include for Korn Shells

by David L. Totsch

ONCE YOU HAVE WRITTEN A FEW Korn shell programs strewn with functions, ideas such as code reuse pop into your head. This thought usually occurs about the eighth time you strip apart several existing shell programs to quickly generate an offspring. If you are willing to take some time writing reusable code, you can use techniques to make that code a part of the shell programs you develop. Basically, there are two ways to accomplish a C type of *#include*:

1. "source" a file that contains your generic code
   or
2. autoload specific functions.

Sourcing a file entails bringing the text of the file into the current environment for execution. That is, it executes as though the sourced file were typed into the current shell script at the point in the file of the source syntax. You can use it to include code segments you have written. I typically use it to set shell parameters common to a group of shell scripts (a configuration file of sorts). I believe in writing independent shell scripts, so here is the syntax I normally use:

```
if [[ -r ${CONFIG_FILE} ]]
then
        . ${CONFIG_FILE}
else
        echo "FATAL ERROR: ${CONFIG_FILE}"
        echo "does not exist or is not readable!"
        exit 2
fi
```

Note that *${CONFIG_FILE}* is set elsewhere before the code. The contents of the file might look like this:

```
####### Set APNAME to the basename of the program
APNAME=${0##*/}
####### Strip off trailing extensions...
APNAME=${APNAME%%.*}

LOG_DIR=/var/opt/${APNAME}/${APNAME}.log
TMP_DIR=/usr/tmp
TMP_ERR=${TMP_DIR}/${APNAME}.${$}.err
TMP_OUT=${TMP_DIR}/${APNAME}.${$}.out
```

The advantages to this kind of configuration file are a single point of change, code size reduction, and coordination of parameter names. Be careful—it can be a real disadvantage, too, especially if someone gets the idea to nest configuration files or source more than a couple. Doing so can make debugging more frustrating than it already is. If you find yourself placing the same sort of parameter setup at the top of very many

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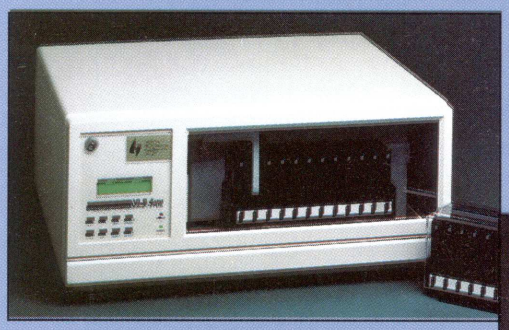

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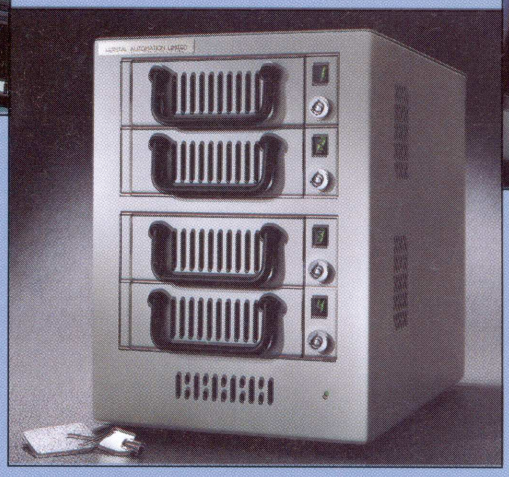

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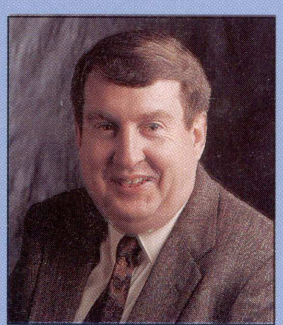

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shell scripts, sourcing configuration files may be a tactic you should consider. These sourced files do not have to be executable.

This sourcing technique works for both Bourne and Korn shells. In the above example, collapse the "[["s and "]]"s into "[" and "]", respectively, for the Bourne shell.

You can also source files that contain functions. Then you can have access to those functions within your shell program.

If you are using the Korn shell, there is an alternative to sourcing a file to make the function a part of the program. To illustrate, I have written the function GETYNANSR. The code appears later. When I write interactive shell programs, I use this function quite often. Here is a short shell program that uses the function GETYNANSR:

```
#!/bin/ksh
FPATH=/usr/local/functions_ksh
typeset -fu GETYNANSR

PROMPT="Is this a test"

if GETYNANSR "${PROMPT}"
then
        echo "Yes, it was."
else
        echo "No, it was NOT."
fi
```

The FPATH parameter tells the Korn shell what directories to search for autoload functions, much as PATH tells it where to look for executables. The `typeset -fu` syntax establishes GETYNANSR as an autoloadable function. Therefore, when the function GETYNANSR is used within the shell, it will scan FPATH for a file of the same name that contains a function of the same name.

Here is the code for GETYNANSR:

```
####### Function GETYNANSR
####### This function returns:
#######         0 for an affirmative answer
#######     and 1 for a  negative    answer
GETYNANSR()
{
####### Loop until an understandable answer is given.
while true
do
     echo "${1} (Y/N) \c"
     read ANSR
     case ${ANSR} in
          [Yy]|[Yy][Ee][Ss] )  ####### Affirmative
                               return 0
                               ;;
          [Nn]|[Nn][Oo] )      ####### Negative
                               return 1
                               ;;
          * )                  ####### Huh????
                               echo "\n\n\tYour input >\c"
                               echo "${ANSR}< \c"
                               echo "was not understood."
                               echo "\tPlease try again.\n\n"
                               ;;
     esac
done
}
```

GETYNANSR loops, displaying the prompt, until the user enters an appropriate answer. A return code is used to pass the answer back. The file GETYNANSWER is in does not have to be executable. Any time I write a shell program that requires a Yes/No answer to a question, I can pass the prompt as parameter one to GETYNANSER and get exactly what I need.

Autoloading functions has the overhead associated with searching for the files, but, once a function is loaded, it does not have to be loaded again. With sourcing, there is the temptation to source a file that contains functions you may not use, unnecessarily increasing the size of the shell program.

The techniques are similar and yet dissimilar—you could write a function that initializes parameters. Either technique will allow you to write reusable code, which has the potential to decrease the amount of time it takes to create new shell programs.■

After serving several different organizations over the past seven years as a system administrator with various flavors of UNIX, David L. Totsch still enjoys the profession. He also enjoys discussing UNIX with just about anyone. At present, he is working with HP-UX systems and wide-area networks for a Fortune 100 company in the Piedmont area of North Carolina. He can be reached via Internet: dtotsch@wfu.edu.

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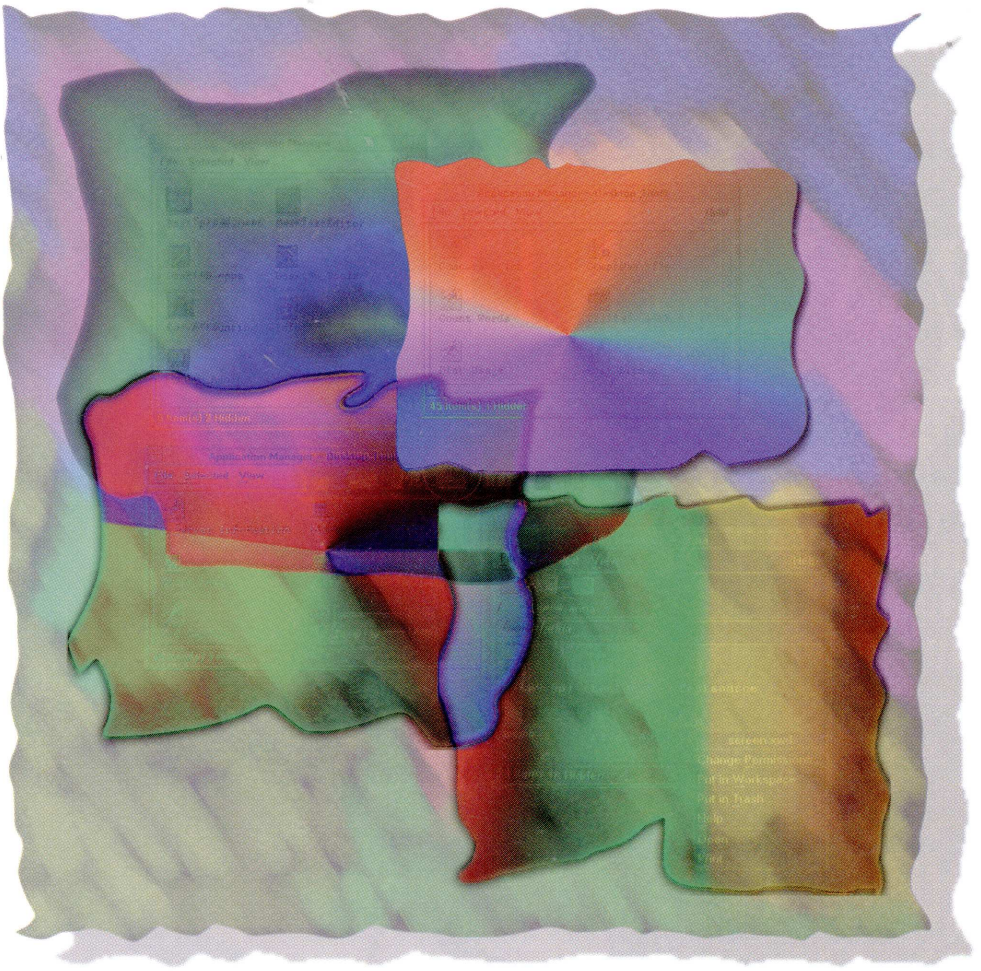


Desktop Application Administration: From HP VUE to CDE

Both HP VUE and CDE provide ways to integrate applications into the desktop's graphical environment. These include:

- A way to start an application by double-clicking an icon representing that application.
- Special containers for these icons.
- The ability to specify unique appearance and behavior for data file icons.

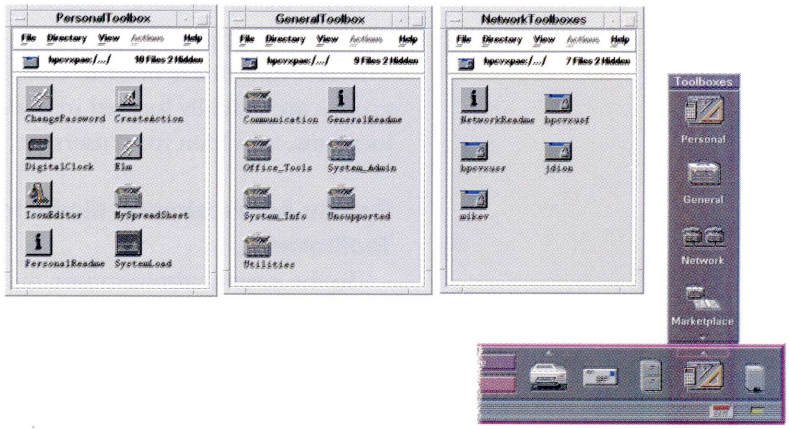
This article describes the end-user and system administration models for the CDE desktop and compares them to the HP VUE model. The article also describes the tools available for moving applications from HP VUE to CDE.

HP VUE User Model for Applications

The default HP VUE configuration includes three toolboxes—Personal, General, and Network—and Front Panel controls for opening them (*Figure 1*).

BY ANNA ELLENDMAN

FIGURE 1 *HP VUE toolboxes and Front Panel controls*



The toolboxes are containers for icons representing applications; the user can launch an application by double-clicking the appropriate icon. The General Toolbox contains applications available to all users on the system, and can be modified only by system administrators. Users can modify the Personal Toolbox by copying applications icons they use frequently from the other toolboxes. The Network Toolbox is a container for applications located on other systems in the network. As with the General Toolbox, only system administrators can modify this toolbox.

CDE User Model for Applications

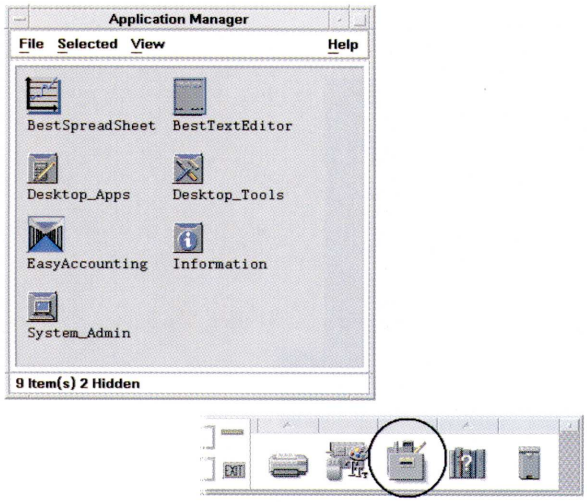
There are several drawbacks to the HP VUE model of three toolboxes:

- There are three different locations for application icons.
- The toolboxes mix application icons and directories in the same view.
- Other files related to applications, such as templates, sample data files, and readme files are generally not placed in the toolboxes.
- The user is not "insulated" from network dependencies.

The CDE Application Manager addresses all of these drawbacks (*Figure 2*). It is a single container for all the applications available to the user, and is opened by clicking a control in the CDE Front Panel. Each item in the top level of the Application Manager is a directory containing one or more related applications. These directories are called application groups.

ILLUSTRATION BY MICHAEL EHRHARDT

FIGURE 2 *CDE Application Manager and application groups*



Usually, an application group is a container for a single application and contains the application icon (used to start the application) plus other files related to the application (*Figure 3*). However, an application group can be a container for many separate applications.

Since the application groups appear together in a single window, they appear to occupy the same file system location. The fact that this is not the case, and that the application groups are actually located in a variety of local and remote locations, is hidden from users.

System Administration Model for the HP VUE Toolboxes

To the system administrator, an HP VUE toolbox is a File Manager view of a special directory:

Personal	*$HOME/.vue/types/tools*
General	*/usr/vue/config/types/tools*
Network	*/usr/vue/config/types/import*

The Personal and General toolboxes are modified by adding icons (files or directories) to these directories. For example, an icon labelled SystemLoad in the Personal Toolbox represents

FIGURE 3 *Contents of application groups*

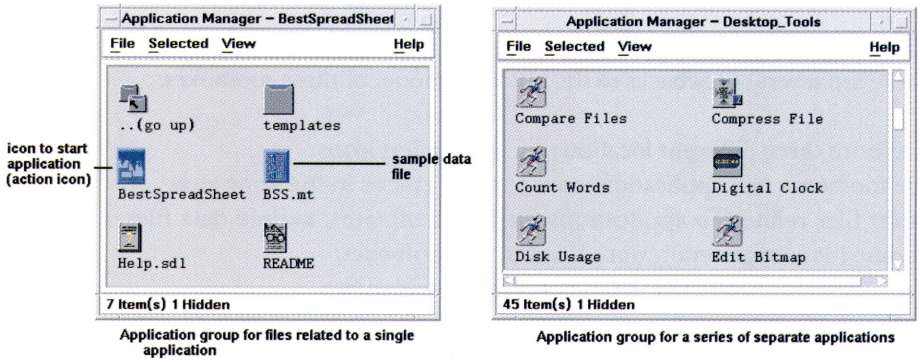


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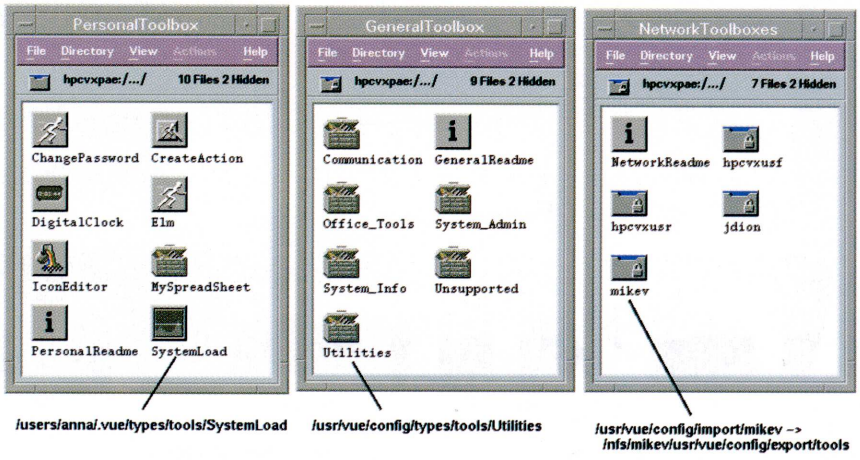
FIGURE 4 *File system locations of HP VUE toolboxes*



the file *$HOME/.vue/types/tools/SystemLoad*, and an icon labelled Utilities in the General Toolbox represents the directory */usr/vue/config/types/tools/Utilities*.

The directories at the top level of the Network toolbox are formed by manually creating symbolic links across file system mounts. By convention, the link is made to a special export location on the application server (see *Figure 4*).

System Administration Model for the CDE Application Manager

To the system administrator, the CDE Application Manager is a File Manager view of a special temporary directory created at login:

```
/var/dt/appconfig/appmanager/login-display
```

For example, when user anna logs into CDE at display hpcvxpae:0, the CDE Login Manager creates the directory:

```
/var/dt/appconfig/appmanager/anna-hpcvxpae-0
```

This directory is recreated each time the user logs in. This is possible because none of the contents of the Application Manager are actually located in this file system location.

How Applications Are Gathered into the Application Manager

After the Login Manager creates the Application Manager directory, it must gather application groups into it. The application groups are gathered by means of symbolic links, and the links are made from multiple locations. This is what makes it possible for the Application Manager to display application groups located in a variety of directories, including personal, system-wide, and remote locations.

The symbolic links that gather the application groups are created by the CDE utility *dtappgather*, which is automatically run by the Login Manager. For example, the desktop provides a built-in application group:

```
/usr/dt/appconfig/appmangager/C/Destkop_Apps
```

At Login time, *dtappgather* creates the following symbolic link:

```
/var/dt/appconfig/appmanager/anna-hpcvxpae-0/Desktop_Apps ->
                        /usr/dt/appconfig/appmanager/C/Desktop_Apps
```

so that the Application Manager contains an application group named *Desktop_Apps*.

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The Application Search Path

The locations from which *dtappgather* gathers applications are directories on the desktop's application search path. The default application search path consists of three local locations:

Personal	*$HOME/.dt/appconfig/appmanager*
System-wide	*/etc/dt/appconfig/appmanager/**$LANG***
Built-in	*/usr/dt/appconfig/appmanager/**$LANG***

where *$LANG* is the value of the *LANG* (language) environment variable. The default value for *LANG* is C.

System administrators (or users) usually will want to add additional locations, especially if networks are configured to distribute applications among a variety of application servers. CDE provides the environment variables *DTSPSYSAPPHOSTS* (system-wide) and *DTSPUSERAPPHOSTS* (personal) for modifying the application search path.

At login time, the Login Manager runs a desktop utility named *dtsearchpath* before running *dtappgather*. *dtsearchpath* assembles the complete application search path by adding the values of these environment variables to the built-in locations.

The application search path variables accept a special syntax that makes it easy to add application servers: `VARIABLE=hostname:`. This syntax is expanded by *dtappgather* (assuming NFS mounts) to the mounted system-wide location on hostname:

```
/net/hostname/etc/dt/appconfig/appmanager/$LANG
```

For example, if *DTSPSYSAPPHOSTS* specifies two remote systems:

```
DTSPSYSAPPHOSTS=SystemA:,SystemB:
```

and these systems contain these application groups:

SystemA */etc/dt/appconfig/appmanager/C/EasyAccounting*
SystemB */etc/dt/appconfig/appmanager/C/BestSpreadSheet*

then *dtappgather* creates the following symbolic links (assuming *$LANG=C*):

```
/var/dt/appconfig/appmanager/anna-hpcvxpae-0/EasyAccounting ->
                    /net/SystemA/etc/dt/appconfig/appmanager/C/EasyAccounting
/var/dt/appconfig/appmanager/anna-hpcvxpae-0/BestSpreadSheet ->
                    /net/SystemB/etc/dt/appconfig/appmanager/C/BestSpreadSheet
```

Figure 5 shows an Application Manager containing application groups gathered from personal, system-wide, and built-in locations, and from two application servers.

Application Infrastructure: Actions, Data Types, and Icons

In both HP VUE and CDE, the ability to create icons representing applications and their data files depends on an infrastructure of desktop constructs:

- Action definitions
- Data type definitions
- Icon image (pixmap and bitmap) files

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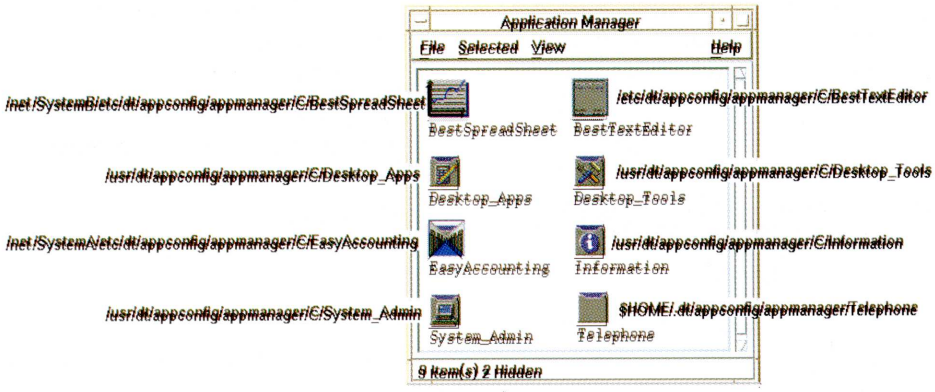
FIGURE 5 *The Application Manager gathers application groups on the application search path*



Actions

The desktop uses actions to create a relationship between an icon in the Application Manager (or File Manager) and a command. Actions are the construct that allow you to create application icons—icons that the user can double-click to run applications.

For example, consider the following definition for an action named *Xwud*:

```
ACTION Xwud
{
  LABEL           Xwd_Display
  ICON            XwudIcon
  DESCRIPTION     Displays an X Windows screen file.
  EXEC_STRING     xwud -in %(File)Arg_1"xwd file to display:"%
}
```

Once an action is defined in the desktop's actions database, you can create an application icon by creating an executable file with the same name as the action (in this case, *Xwud*). The action definition describes the appearance and behavior of the application icon. *Figure 6* shows how the ICON and LABEL fields describe its appearance.

The DESCRIPTION and EXEC_STRING describe its behavior. The DESCRIPTION field contains the text displayed in the CDE Help Viewer when the user selects the icon and requests help (F1). The EXEC_STRING specifies the command run when the user double-clicks the icon. In the case of the *Xwud* action, the command is:

```
xwud -in file
```

where *file* is the file argument. The portion of the EXEC_STRING that represents the file argument is:

```
%(File)Arg_1"xwd file to display:"%
```

If the user drops a data file on the icon labelled Xwd_Display, its pathname is used as the argument. If the user double-clicks the icon, the action prompts for that path by displaying a dialog box with a text field labelled *xwd file to display:*.

Data Types

Files are represented in the CDE File Manager as icons that users can manipulate. The appearance and behavior of these icons are described by "data types."

A data type definition has two parts:

- DATA_ATTRIBUTES defines the files' appearance and behavior.
- DATA_CRITERIA specifies the criteria used to

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FIGURE 6 *Icon for the* Xwud *action*

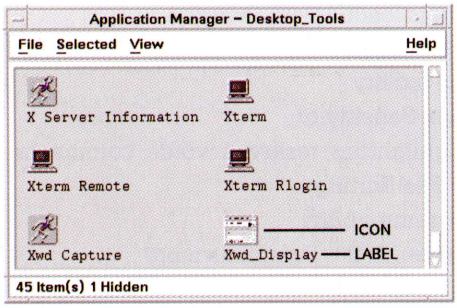
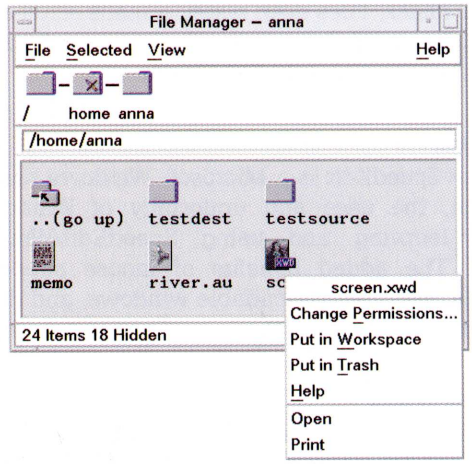


FIGURE 7 *An XWD data file in File Manager, with "Open" in its pop-up menu*



assign a file to that data type.

For example, here is a data attributes definition for X window dump files (the data files for the *Xwud* action):

```
DATA_ATTRIBUTES XWD
{
  ACTIONS       Open
  ICON          Dtxwd
  DESCRIPTION   This file contains an XWD graphics image.
}
```

The ACTIONS field lists one or more actions that can be run on the file from the File Manager, in this case, *Open* (see *Figure 7*).

The criteria definition specifies that typing is name-based—files are type XWD if their file names end with *.xwd*. (CDE also supports content-based data typing.)

```
DATA_CRITERIA XWD1
{
DATA_ATTRIBUTES_NAME   XWD
MODE                   f
NAME_PATTERN           *.xwd
}
```

The *Open* behavior for XWD files is to display the file using the Xwud action. The connection between *Open* and the *Xwud* action is made through another action that maps the *Open* action to the *Xwud* action for the XWD data type:

```
ACTION Open
{
        TYPE            MAP
        MAP_ACTION      Xwud
        DATA_TYPE       XWD
}
```

Creating Actions and Data Types with the Create Action Application

The desktop includes an application, *Create Action*, that allows users and system administrators to create actions and data types without having to learn the syntax rules for the definitions. It provides fill-in-the-blank text fields for supplying various parts of the action and data type definitions, and lets you browse and choose from available icons. Furthermore, *Create Action* allows you to enter the command to be executed (EXEC_STRING) using shell language (*$n*) for file arguments.

Create Action is optimized for creating

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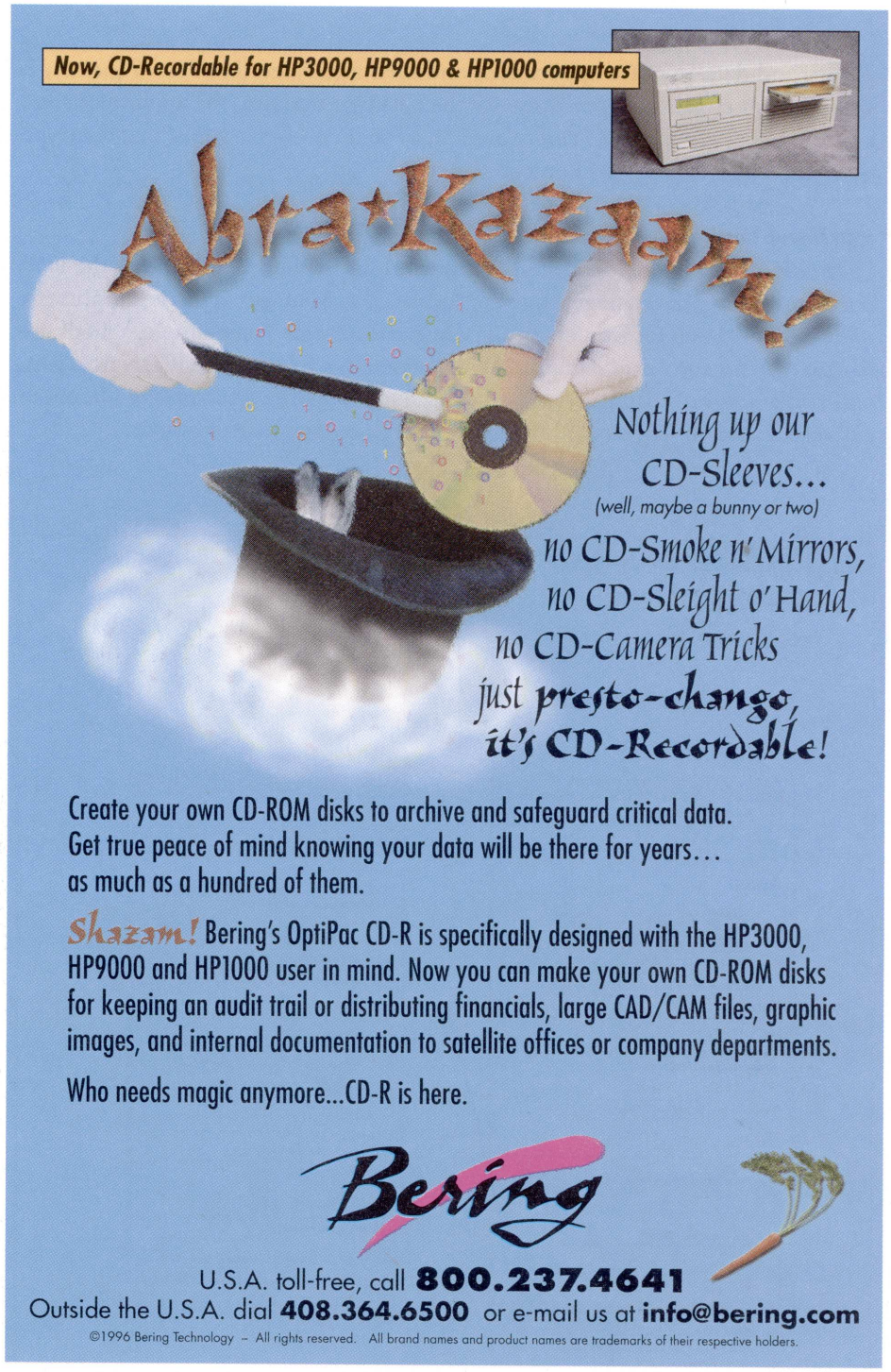

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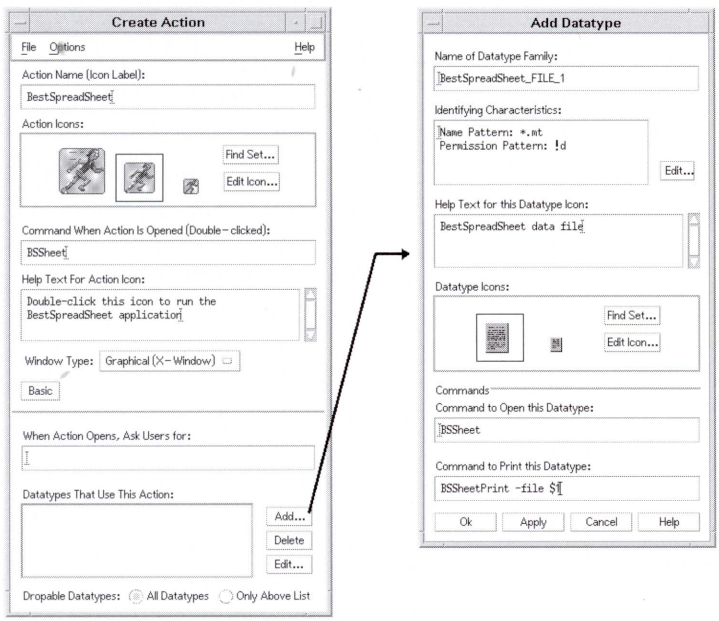
actions and data types for applications and their associated data files (*Figure 8*). It automatically creates an *Open* action for the data type that runs the application, and lets you specify an optional Print command to be used when a file of that data type is dropped on a desktop printer icon.

Icon Image Files

Action and data type definitions include an ICON field that specifies the icon image to use in File Manager and the Application Manager. The desktop uses a naming convention for icon image files: *basename.size.type*. For example, a medium-size pixmap for the *Xwud* action might be named `Xwud.m.pm`. The ICON field generally specifies only the base name; the desktop adds the appropriate file name extensions, depending on File Manager view setting and type of display.

FIGURE 8 *Create Action Windows*



How the Desktop Finds Actions, Data Types, and Icons

As with application groups, the desktop uses search paths to locate action and data type definitions, icon files, and help volume files. The default search path locations are analogous to the application search path locations (see *Figure 9*). An additional requirement for action and data type definition files is that they use the naming convention **.dt*.

The actions/data types, icon, and help search paths are automatically updated when the application search path is modified. This ensures that the desktop will find all the desktop configuration files needed by the application. For example, if SystemA is added to the application search path, the locations:

*/net/SystemA/etc/dt/appconfig/types/**$LANG***
*/net/SystemA/etc/dt/appconfig/icons/**$LANG***
*/net/SystemA/etc/dt/appconfig/help/**$LANG***

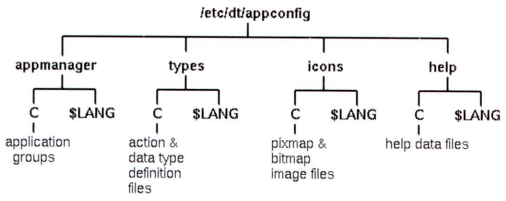
are automatically added to the desktop search paths.

Application Registration in CDE

An application can be integrated into the desktop by placing the desktop configuration files into locations specified by the desktop search paths. However, this can make administration difficult, since the desktop configuration files for an application are scattered among numerous directories, each of which contains files for many applications. It is usually preferable to gather all the configuration files for an application under one location, called the application root, or *app_root*. CDE allows you to do this by providing a utility, *dtappintegrate*.

The function of *dtappintegrate* is to create links between the files in the *app_root* location and the system-wide

FIGURE 9 *Directory structure of system-wide desktop configuration files*



search path locations. The process of creating these links with *dtappintegrate* is called "application registration." The collection of desktop configuration files beneath the *app_root* directory is called the "registration package."

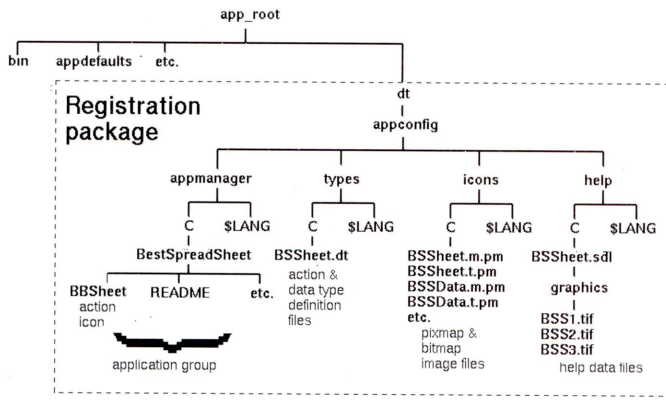
Figure 10 illustrates a registration package for an application named *BestSpreadSheet*.

The structure of the registration package closely resembles the structure of the system-wide configuration files (compare *Figure 10* with *Figure 9*).

Once the registration package has been created, the system administrator runs *dtappintegrate* to create the symbolic links shown in *figure 11*:

```
dtappintegrate -s app_root
```

FIGURE 10 *Example of a registration package*



Application Servers in HP VUE and CDE

Both HP VUE and CDE provide two ways for a local system (or session server) to access remote applications:

- An action can be written to run its command (EXEC_STRING) on a specified remote system. The action definition uses the EXEC_HOST field to specify where the command is run. All the other desktop configuration files remain on the local system. The EXEC_HOST method is almost identical between HP VUE and CDE.
- The desktop can access a remote desktop application server that contains the application and all the desktop configuration files. The CDE model for application servers is similar to HP VUE, but has been modified to simplify administration.

HP VUE Model for Desktop Application Servers

The HP VUE Network Toolbox provides users with access to applications on application servers. Applications are said to be "imported" into the client's Network Toolbox and "exported" by the application server (*Figure 12*).

The two systems contain special directories for this purpose. The import location on the client is the Network Toolbox. The export location on the application server contains the action and data type definitions, and the *tools* directory beneath it becomes the application server's entry in the Network Toolbox. The administrator directs the client to search the server's export location by setting a special environment variable, *VUEACTIONREMOTEHOST*. The administrator must manually create the symbolic link between the Network Toolbox and the *tools* directory on the server.

CDE Model for Desktop Application Servers

CDE does not set aside special import and export locations for networked

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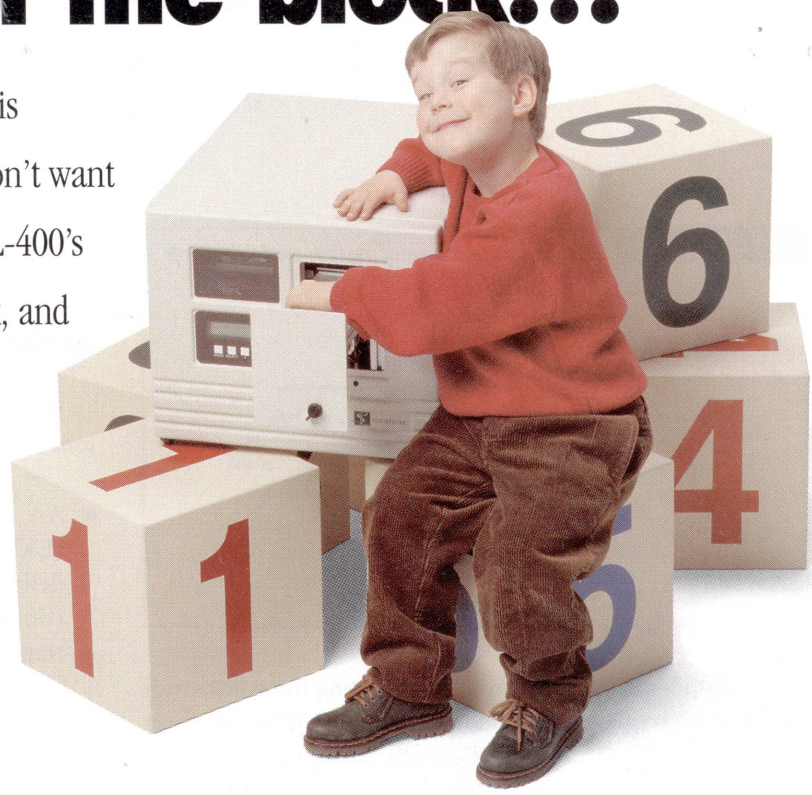

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FIGURE 11 *Links created by* **dpappintegrate**

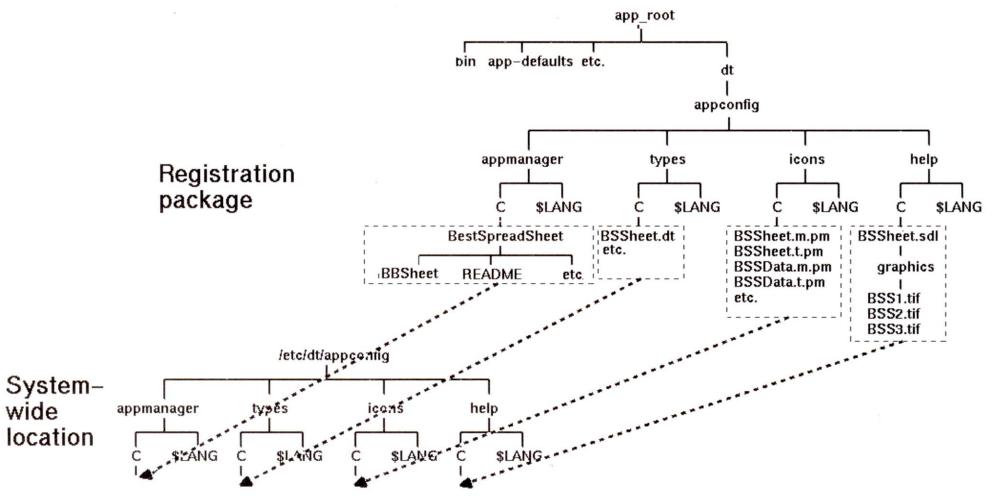
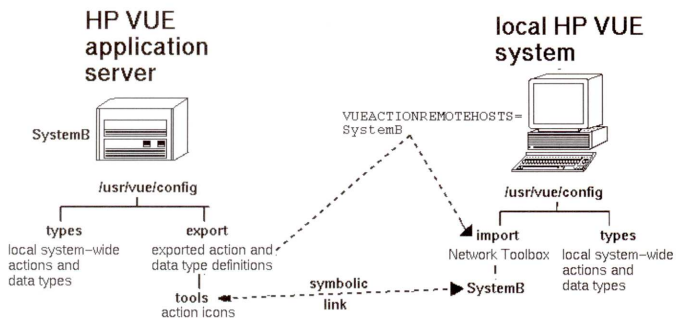


FIGURE 12 *HP VUE application server configuration*



applications. By default, all system-wide applications registered on an application server are available to all systems that use that application server.

A client adds an application server by setting the application search path variable *DTSPSYSAPPHOSTS*. Application groups on the server are automatically added to the Application Manager, and the search paths for actions, data types, icons, and help files are automatically updated (*Figure 13*).

Migrating Applications from HP VUE to CDE

CDE provides a migration tool that moves many HP VUE customizations to CDE, including customizations that were made to add applications to the HP VUE Toolboxes. Migration can be done on a system-wide or personal (per-user) basis.

The *VUEtoCDE* migration tool performs the following application-related tasks:

1. It translates HP VUE actions and data type definitions to the CDE syntax and places these new files in locations on the CDE actions search path.
2. It copies custom icons to locations on the CDE icon search path and renames them to use CDE naming conventions.
3. It copies help volume files to locations on the CDE help search path. The CDE help viewer can display files

created using the HP VUE Help System.

4. It creates a personal application group for the Personal Toolbox, and a system-wide application group for the General Toolbox. Thus, those toolboxes and their contents become available in the Application Manager.

These changes are non-invasive to the HP VUE configuration files. Therefore, systems that run both HP VUE and CDE at different times can have the same applications available from both desktops (*Figure 14*). ◧

Acknowledgments: *I was lucky to have the help of Human Factors engineer Jay Lundell during many phases of the CDE project. CDE architect Brian Cripe was a tireless teacher and reviewer. In addition I am grateful to Molly Joy, who had engineering responsibility for VUEtoCDE, for her willingness to work closely with the writers during the development of the tool. Finally I was fortunate to have ongoing support and encouragement from my manager, Mason Lakowske, and from CDE project leader Bob Miller.*

Anna Ellendman is a Learning Products engineer for the Technical Computing Center of HP's Workstation Systems Division in Corvallis, Oregon. She was HP's project leader for the CDE documentation, and co-authored the CDE Advanced User's and System Administration Guide with writers from IBM.

FIGURE 13 ***CDE application server configuration.***

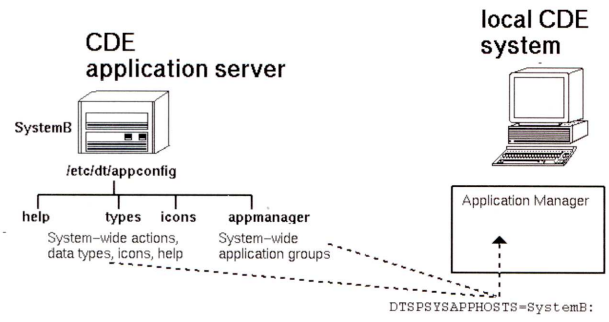
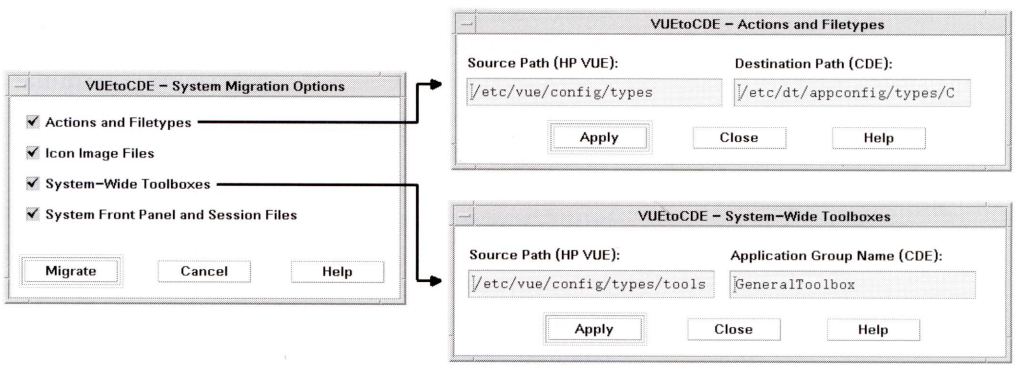


FIGURE 14 ***VUE to CDE Migration Tool dialog boxes***



Software Review

by Greg Cagle

Siren Mail

THE SUBJECT OF THIS review is Siren Mail, an X/Motif Mail User Agent for UNIX platforms, from Siren Software, a division of Vicor (Visionary Corporate Technologies), Inc. Siren Mail is part of the Siren Messaging Environment, which also includes Siren Fax, a client-server fax package, Siren Directory, an X.500 directory agent, and Siren Address Book, which provides one common address book for the Siren products. Siren Mail is available for numerous UNIX systems, including SunOS, Solaris, HP-UX, AIX, Motorola 88K, and DG-UX. Siren Mail is also available for Windows and Macintosh platforms. The version reviewed is 2.02, running on an HP 715/80 at HP-UX 10.01 under CDE. Siren does not officially support 10.x, but I had no problems running on 10.01 (with compatibility links), where it behaved no differently than on HP-UX 9.05.

Features

X/Motif Interface

Siren Mail's interface is comparable to other Motif interfaces I've used. It allows multiple folders to be opened at once (*Figure 1*), which I view as a distinct advantage over some of the competition. Like other mailers, it has a menu bar, a list of messages, and a customizable button area. The menu bar is logically divided into **Folder**, **Message**, **View**, **Compose**, and **Utilities** submenus.

Messaging Environment Integration

Siren Mail can be integrated with Siren Fax and the other Siren Messaging products through the Siren Message Server. The idea behind the Server is to have a central server for SMTP, X.400, and fax messages. Siren Mail has a "fax" button in the **Compose** window (*Figure 2*) which, I assume, allows faxing of a mail message via a configured fax server, but I don't have the facilities to test it. This environmental integration is unique among the MUAs I've dealt with.

Character Mode Interface

Siren Mail includes a very intuitive character-mode interface, much like elm or pine. I used it successfully from both hpterm and vt100 (dtterm) windows on my workstation (*Figure 3*), and it also works great from Reflection on a PC. It's a viable option for those who need character-mode interfaces within a terminal emulator or on an actual terminal.

MIME Capability

Siren Mail is MIME-capable, in a limited fashion. MIME enclosures in received mail are treated as attachments, and an external viewer (metamail by default) is spawned to display the enclosure. This is similar to Z-Mail, but less elegant than ishmail, which spawns its own Motif viewer, or Netscape, which

At-a-Glance

Siren Mail 2.02

Siren Software
505 Hamilton Ave
Palo Alto, CA 94301
e-mail: info@siren.com
Phone: 415-322-0600
Fax: 415-322-9999
http://www.siren.com

Price

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FIGURE 1

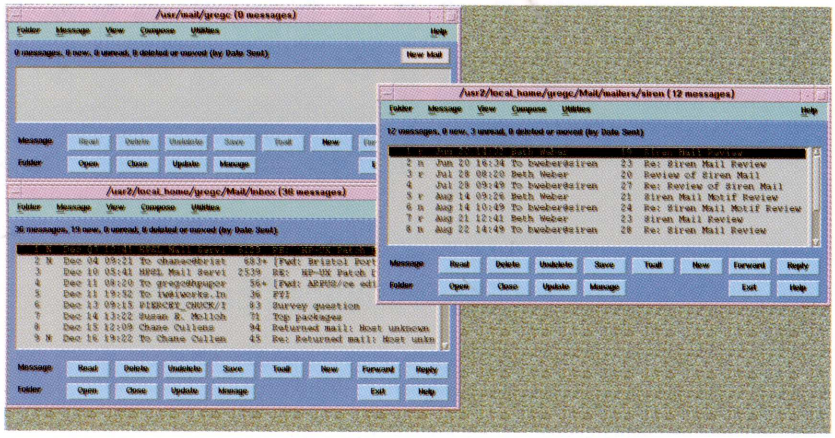


FIGURE 2

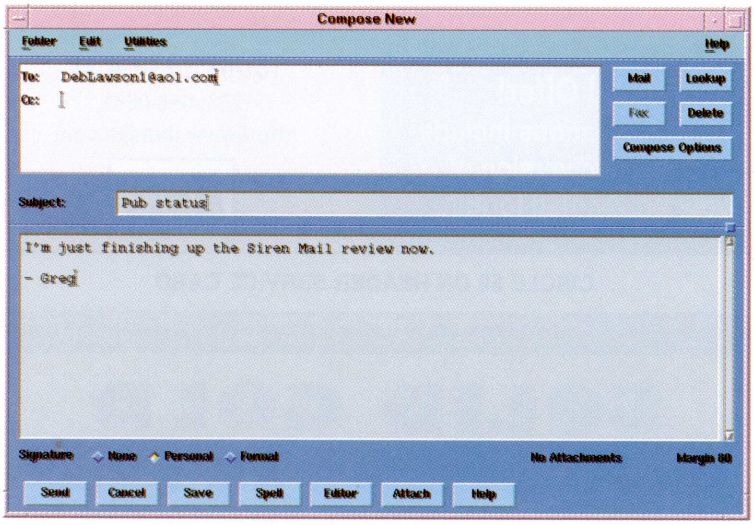
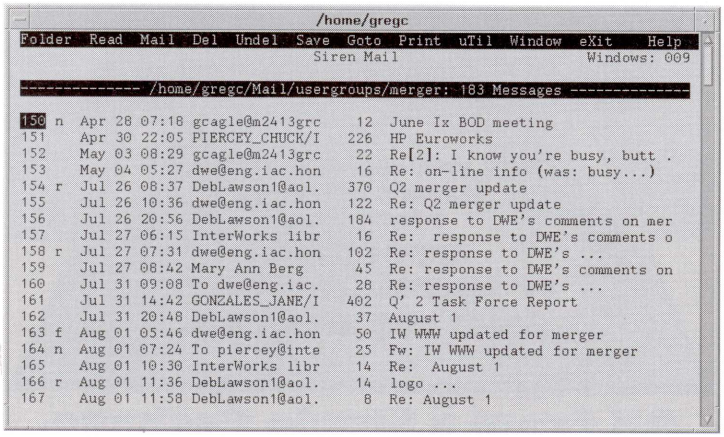


FIGURE 3



shows the enclosure inline. Siren Mail does not support rich text composition as do ishmail and Netscape; the best you can do is attach already composed MIME files.

Customization

Customization of Siren Mail is supported by a series of menu items under the **Utilities** menu. These allow you to customize buttons, headers, colors, and fonts, and to configure general items. The button manager allows you to specify up to two rows of eight buttons each in the **Folder Index**, **Compose**, and **Read** windows. Each button can refer to a function normally accessed via menus, with a label of your choice. The header manager is intuitive and allows specification of headers to display as well as headers to ignore. The color manager allows you to specify the colors of just about every feature, either by name or by color sample. It allows the truly daring to define their own colors. The font manager is equally flexible and shows example text of your font choices as you make them. The general preferences dialogue allows the usual type of customizations; one feature I like is the capability of choosing the kind of signature to appear—personal, formal, or none. Another feature I like is the ability to customize the "included text" delimiter, and allow a sample include action to be viewed.

Searching and Sorting

Searching is accomplished with the **Search Messages** dialog box, accessed under the **Utilities** menu. It's quite flexible and allows searching for text strings between date limits in a particular folder or in all open folders. For some reason, many mailers have a problem seeing the

need for this last feature. I strongly dislike using the UNIX *find* command for this. Siren Mail also allows you to specify particular parts of the messages to search, and optionally to ignore case and find nonmatching strings. It does not support UNIX regular expression searching.

Sorting is controlled by the **View** menu pulldown. It allows you to sort the folder displayed in the window by date sent, date received, status, length, author, or subject. You can also mix and match these to create a custom sort. Siren Mail also supplies a convenient menu pick to invert the current sort.

Folder Management

Siren Mail's folder manager (*Figure 4*) is reasonably flexible, but it does not support drag and drop activities. Siren Mail distinguishes between "open" and "closed" folders; this allows you to limit certain activities (such as searching) to "open" folders only.

Address Book

Siren Mail supplies an "address book" (*Figure 5*), which allows personal aliases and lists of aliases as well as system-level definitions. It also allows fax numbers to be specified for the Siren Fax product, which shares the address book. Other MUAs, however, cannot share the address book. And, try as I might, I couldn't get the "Use" button to work in the **Address Book** window, no matter what I highlighted or double clicked, in any context.

Online Context-Sensitive Help

The online help (*Figure 6*) supplied with Siren Mail appears to be complete, if a little crude. The only context it knows about appears to be on a window basis,

FIGURE 4

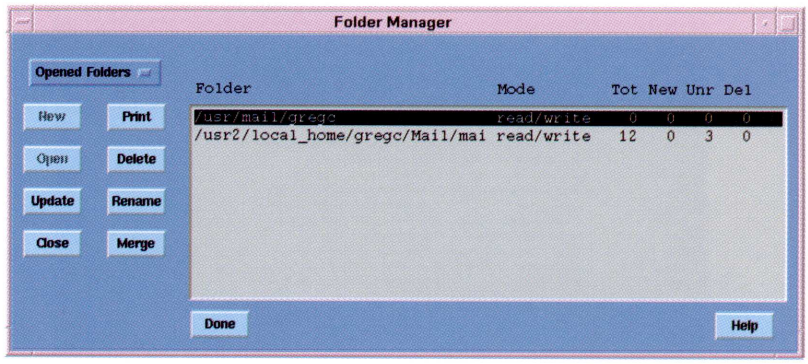


FIGURE 5

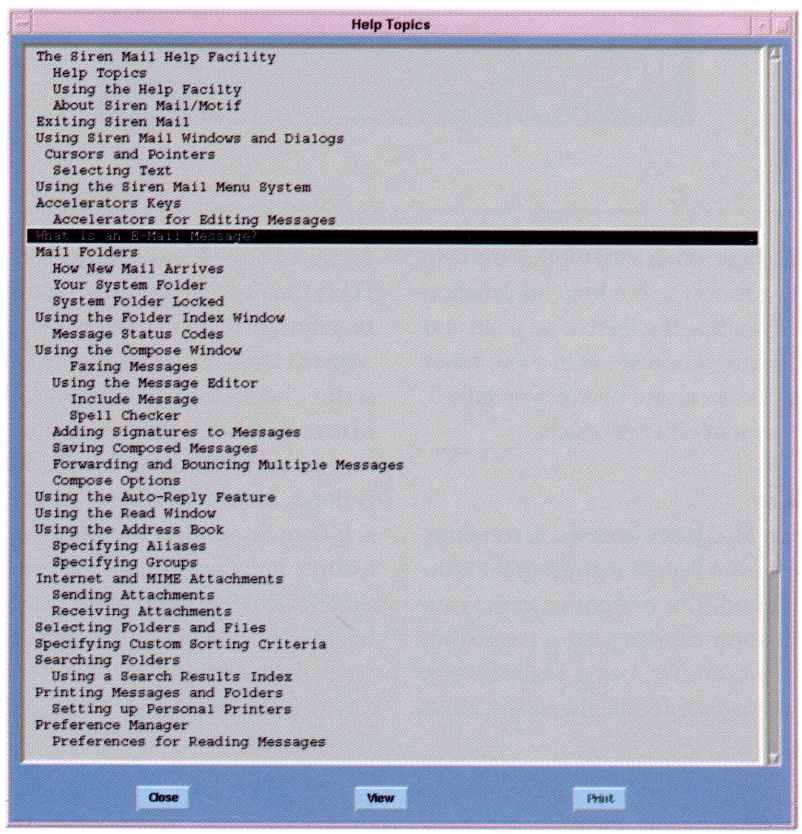


FIGURE 6

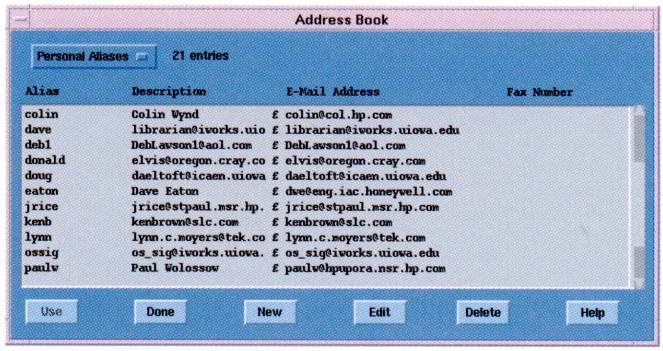


FIGURE 7

meaning that within each window the help button gets you to the help information for that window. But there is no point and click feature sensitivity, as in some other mailers I've seen, and it's not hyperlinked, as I've seen in other products.

Licensing

Siren Mail is not licensed at run-time, so there is no license management activity required. I'm not going to get into a philosophical discussion regarding software licensing; being basically lazy, let's just say I appreciate the lack of effort required.

Installation

Installation of Siren Mail is typical of such products in my experience. The version I tested was shipped on 4mm DAT; the process requires 5 megabytes of scratch area and 10 megabytes of permanent storage, which the installation script checks for you. The installation instructions are quite good and cover remote and NFS server installation procedures. Siren Mail is installed in its own self-contained directory and does not assume a default. I used */opt/sirenmail* on HP-UX 10. As with other UNIX mail agents, Siren Mail requires permissions to set the mail group ID in order to create lock files if they are being used on the system.

Usability

Compatibility with other MUAs is what you would expect; folder formats are compatible, and standards are complied with. I could not determine if Siren Mail supports conversion to or from mh folder format; it was not mentioned in the documentation or online help. Siren Mail does not use index files, and many other MUAs do; this can create compatibility issues where other MUAs may have a different view of the folder than Siren Mail does. To be safe, in an environment with different MUAs in use, I recommend disabling index files where that is an option. You can generally identify index files by looking in the same directory as the indexed folder for a "dot" file named after the folder in question. For example, a folder named *deb* may have an index file named *.deb-index* or something similar. Another usability issue is the aliasing mechanism mentioned above; most MUAs seem to be settling on *~/.mailrc* for this.

Reliability

I've had a few problems with the Motif version of Siren Mail, one of which is shown in *Figure 7*; messages with multiple addressees corrupt the "To:" header display. The example composition, for example, has five addressees, but you can see only the last one. The problem with the "Use" button in the Address Book mentioned above is also an issue.

Performance

Siren Mail performed a little slower than other mailers I've used. Most other mailers use index files to speed access to folders, but Siren Mail does not support that to my knowledge. Opening my favorite mail hog folder (870 messages, 2.2-MB size) takes about 10 seconds. While slower than other mailers I've used, it's still acceptable. For reference,

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the Netscape mailer takes less than a second to open the same folder after indexing it.

Supportability

Both character and Motif versions of Siren Mail are dynamically linked with system, X11, and Motif libraries. The application is therefore vulnerable to bugs introduced in new versions of these libraries on the runtime system. But, the binary of *smmotif* is just over 1 MB in size, while by comparison the ishmail 1.1 binary is 5 MB.

Documentation

Siren Mail is shipped with hardcopy versions of the *Installation Guide*, the *Release Notes*, a 61-page "Quick Start" guide, an *Administrator's Guide*, and a *User's Guide*. The *Administrator's Guide* and the *User's Guide* are also shipped with the product in PostScript format. The *Administrator's Guide* covers managing folders, configuration files, address books, forms, and attachments. It is clearly targeted for the system administrator. The *User's Guide* is primarily concerned with sending and receiving messages and using folders, address books, forms, and attachments. Both manuals are replete with examples and graphics, and appear to be quite complete.

Summary

Siren Mail has some good features and is competitive with other MUAs I've reviewed up to now. I've seen Ishmail 1.1, though, and it is a big improvement over 1.0. Netscape Mail has its own set of advantages, including Web integration and message threading.

The Siren Mail Motif Client is $195. Clients for MS Windows (3.1, 95, and NT) and the Macintosh are $100. Quantity discounts are available. Anything over $100/seat is too much, in my opinion, and the advent of the CDE desktop with the integrated Sun mailtool makes a purchasing decision that much more complicated. Evaluation copies of Siren Mail are available for downloading at the Siren Web site. ◧

Greg Cagle is a technical consultant with HP's Professional Services Organization, specializing in HP-UX and workstations. In his spare time he is a member of the Executive Committee of InterWorks, the Technical Users Forum of Interex. He can be reached at (503)598-8205 or gregc@hpupora.nsr.hp.com.

Developing Client-server Applications Using HP Distributed Smalltalk

BY FREDERICK F. CHEW

PART 2

WRITING THE APPLICATION

The Smalltalk Classes of the Application

The bulletinboard application consists of two classes (see *Listing 1*). The following briefly describes the purpose of each:

BulletinboardPO: BulletinboardPO represents the presentation object (*PO*) of the application. This PO class has Interface Repository operations to send the contents of HP-UX environment variables (*getDisplayId* and *getUserId*) to its semantic counterpart. The *open* instance method of this class displays the actual dialog box in which the user selects and retrieves the desired products. The specifications of the dialog box are contained within a class method called *windowSpec* in *BulletinboardPO*. These specifications are processed by a VisualWorks builder object to create the dialog box.

BulletinboardSO: BulletinboardSO represents the semantic object (*SO*) of the application. *BulletinboardSO* has some Interface Repository operations (*checkUserUpdate:* and *resetUserUpdate:*) to control the retrieval of the product selection file (*prodbbs.bos*). There is also an operation (*delete:*) to remove the user from the list of active users when the dialog box closes.

The DSTPresenter and DAAapplicationObject Classes

The presentation-semantic split paradigm of HPDST hides many distribution management details and gives the developer a jump start in the development of distributed applications. In order to make use of existing life cycle, link, event notification, and other services that are part of this paradigm, it is important to subclass the presentation and semantic objects from the proper classes of the Smalltalk framework.

BulletinboardPO is derived or subclassed from *DST-Presenter*, an abstract presentation class. By inheriting from *DSTPresenter*, one auto-

matically acquires default services such as window management and input controller management. Most important, *DSTPresenter* holds the key to communication with remote semantic objects.

BulletinboardSO is derived or subclassed from *DAAapplicationObject*. Application objects are designed to support the standard and extended set of services, such as naming, properties, event notification, links, and life cycle.

Key Instance Methods: abstractClassId and CORBAName

For each PO or SO class, there are two very important instance methods: *abstractClassId* and *CORBAName*. The abstract class ID is a *universal unique identifier* (*UUID*) for a PO or SO class and is used by the Object Request Broker to locate the receiver of a message. A UUID string can be found by typing

```
ORBObject  newId
```

into a workspace window, highlighting the statement and executing **print it**. The highlighted string result can then be copied into the body of the *abstractClassId* method with the *asUUID* message sent to it, like the one for *BulletinboardPO:*

```
^'6b7801f1-6e93-0000-020f-
                0328dd000000' asUUID.
```

The *CORBAName* instance method tells the Object Request Broker that the class has an interface in the Interface Repository (represented by the *DSTRepository* class). The *CORBAName* method for *BulletinboardPO* has one statement:

```
^#'::Bulletinboard::BulletinboardPres'
```

where *Bulletinboard* is the user-defined module name and *BulletinboardPres* is the user-defined interface name. The interface is a collection of *Interface Definition Language* (*IDL*) operations in which each operation is mapped to a matching Smalltalk method. The IDL operations are declared within the *DSTRepository* class.

The DSTRepository Class

The *DSTRepository* class is HPDST's implementation of the CORBA Interface Repository. This class is very special because its methods (or rather, *modules*) are not written in Smalltalk, but in the language-neutral *Interface Definition Language* as defined by the Object Management Group. IDL is strictly a specification language to describe interfaces. With IDL, all ORBs have a common language regardless of the implementation languages (e.g., C, C++, Smalltalk, Ada) used by cooperating host systems. HPDST transparently performs all of the binding between Smalltalk and IDL and vice versa.

The external IDL operations belonging to a Smalltalk class must be registered in the *DSTRepository* class. For the bulletinboard application, all such methods are under the method category called *bulletinboard IFs* (see *Listing 2*). This method category contains one module: *Bulletinboard*. The *module* is defined as a logical grouping of related interfaces. In this case, it encompasses the interfaces for both the presentation (*BulletinboardPO*) and semantic (*BulletinboardSO*) classes. Within the body of each of the interfaces is a series of IDL declarations.

Let us examine a fragment of module *Bulletinboard*:

```
module Bulletinboard {
    #pragma IDENTITY = 6bb51563-e997-0000-020f-0328dd000000
    interface BulletinboardPres : Presentation  {
    #pragma SELECTOR = getDisplayId
    string      getDisplayId();
    ...
    };
    #pragma IDENTITY = 6bb51563-e999-0000-020f-0328dd000000
    interface BulletinboardSem : ApplicationSem  {
    #pragma SELECTOR = checkUserUpdate:
    boolean     checkUserUpdate(in string aUser);
    ...
    };
};
```

Notice where the *Bulletinboard* and the *BulletinboardPres* names appear and how these names correspond to the only statement within the *BulletinboardPO>>CORBAName* instance method (refer to the previous section or *Listing 1*).

Note: the >> is called the *object-method pairing* symbol. *BulletinboardPO>>CORBAName* means the instance method called *CORBAName* within class *BulletinboardPO*.

When a new module is about to be declared by the developer, HPDST will

Illustration by Courtney Granner

LISTING 1 *Bulletinboard Application Classes*

```
DSTPresenter subclass: #BulletinboardPO
   instanceVariableNames: 'bbdSelectionInList retrieveStatus itemList selectedFileName '
   classVariableNames: 'Continue MaxInstances UserId '
   poolDictionaries: ''
   category: 'DST-Bulletinboard'

 BulletinboardPO methodsFor: 'repository'

abstractClassId

   ^'6b7801f1-6e93-0000-020f-0328dd000000' asUUID.

CORBAName

   ^#'::Bulletinboard::BulletinboardPres'

 BulletinboardPO methodsFor: 'initialize'

initialize

   | userName |
   userName := CEnvironment getenv: 'USER'.
   (userName = '') ifTrue:
      [
      (CEnvironment userEnvironment) add: 'USER'->'guest'.
      self class userId: 'guest'.
      ]
                              ifFalse:
       [
      self class userId: userName.
      ].
   self class defaultStyle: #windowSpec.

open

   | updateStatus bosFilename |
   bosFilename := Filename named: 'prodbbs.bos'.
   bosFilename exists ifFalse:
      [
      ^Dialog warn: 'Information file ''prodbbs.bos'' does NOT exist    Contact support for help.'
      ].

   (self class allInstances size <= self class maxInstances) ifTrue:
      [
      (self class allInstances size < self class maxInstances) ifTrue:
            [
            self class maxInstances: (self class allInstances size).
            ].
      updateStatus := self semantic checkUserUpdate: (self class userId).
      super open.
      (self builder componentAt: #abortButton) disable.
      updateStatus ifTrue:  [ (self builder componentAt: #updateButton) enable. ]
                   ifFalse: [ (self builder componentAt: #updateButton) disable. ].
      self refreshList.
      ^self.
      ]
                                    ifFalse:
      [
      ^Dialog warn: 'You may run only one instance of the program at a time  '.
      ].

 BulletinboardPO methodsFor: 'actions'

transfer: aSelection with: aFile
   [
   self class continue: true.
   (aFile = 'prodbbs.bos') ifFalse:
      [
      self retrieveStatus value: aSelection, ' being retrieved...'.
      (self builder componentAt: #abortButton) enable.
      ]
```

Continued on Page 50

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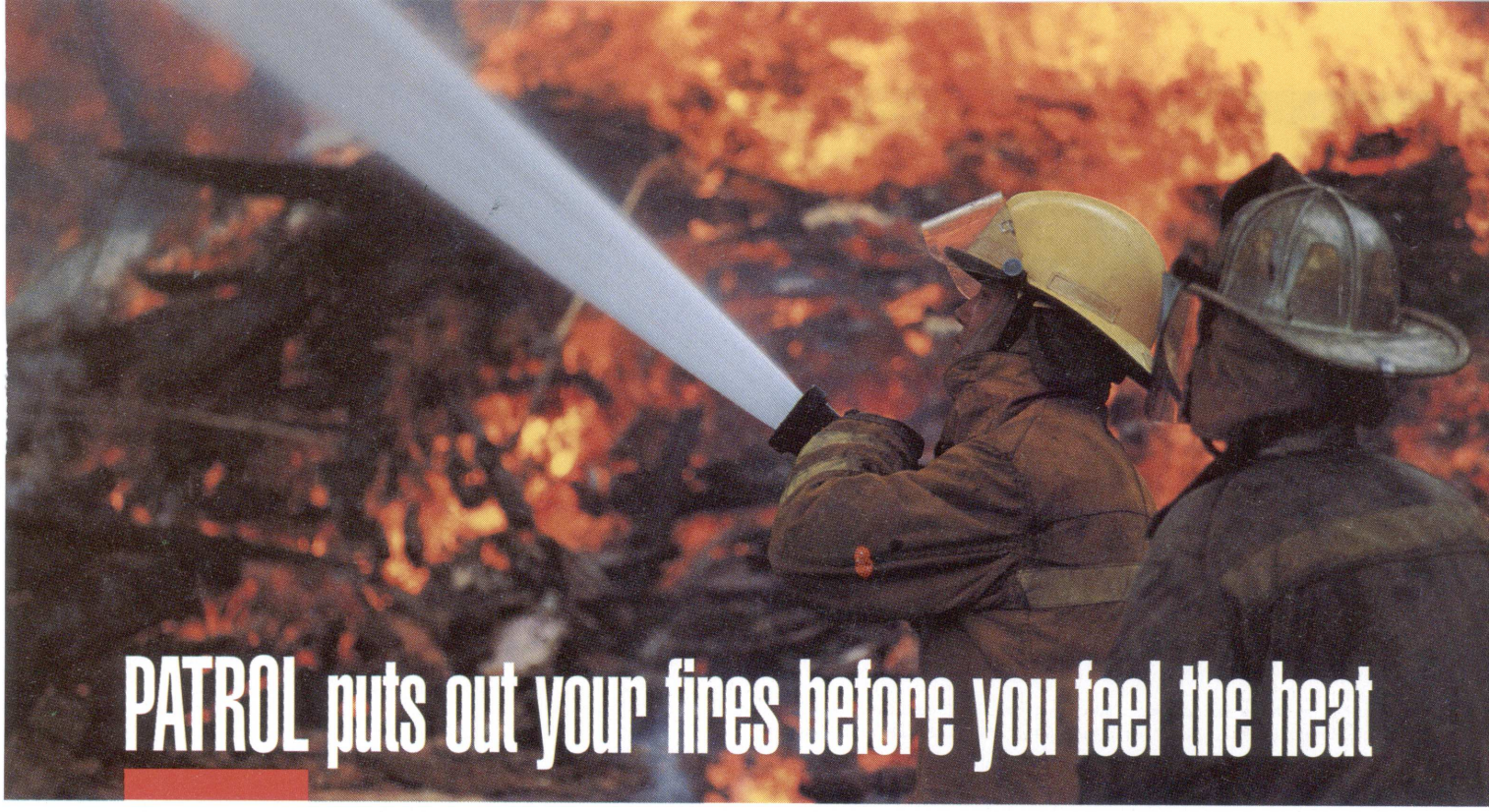

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CIRCLE 5 ON READER SERVICE CARD

LISTING 1 *Bulletinboard Application Classes, continued*

```
                                    ifTrue:
      [
      self retrieveStatus value: 'The product selection listing is being updated...'.
      (self builder componentAt: #abortButton) disable.
      ].
   (self builder componentAt: #retrieveButton) disable.
   (self builder componentAt: #closeButton) disable.
   UnixProcess cshOne: 'getprod.ksh ', aFile.
   self class continue ifTrue:
      [
      (aFile = 'prodbbs.bos') ifFalse: [ self retrieveStatus value: 'Retrieval completed    '. ]
                              ifTrue: [ self retrieveStatus value: 'Update completed    '. ].
      (self builder componentAt: #abortButton) disable.
      (self builder componentAt: #retrieveButton) enable.
      (self builder componentAt: #closeButton) enable.
      2 timesRepeat: [ Screen default ringBell ].
      1 timesRepeat: [ (Delay forSeconds: 2) wait ].
      self retrieveStatus value: ' '.
      (aFile = 'prodbbs.bos') ifTrue: [ self semantic resetUserUpdate: (self class userId). ].
      ].
   ] fork.
   ^ self.

"Instance methods not shown:  abort, close, refreshList, retrieve, update, postOpenWith:,
 windowEvent: from:, bbdSelectionInList, itemList, retrieveStatus "

 BulletinboardPO methodsFor: 'BulletinboardPres'

getDisplayId

   ^CEnvironment getenv: 'DISPLAY'.

getUserId

   ^CEnvironment getenv: 'USER'.

BulletinboardPO class
   instanceVariableNames: ''

"Class methods not shown:  continue, continue:, maxInstances, maxInstances:, userId, userId:, windowSpec "

DSTapplicationObject subclass: #BulletinboardSO
   instanceVariableNames: ''
   classVariableNames: 'UserList UserSemaphore '
   poolDictionaries: ''
   category: 'DST-Bulletinboard'

 BulletinboardSO methodsFor: 'repository'

abstractClassId

   ^'6b7801f1-6e94-0000-020f-0328dd000000' asUUID

CORBAName

   ^#'::Bulletinboard::BulletinboardSem'

productName

   ^'Bulletinboard'

 BulletinboardSO methodsFor: 'presenters mgmt'

updatePresenter: aPO

   | userFound userId |
   userId := aPO getUserId.
   userFound := self class search: userId.
   userFound ifFalse: [ self class add: userId. ].

 BulletinboardSO methodsFor: 'BulletinboardSem'

checkUserUpdate: aUser

   | usersFile recArray |
```

LISTING 1 *Bulletinboard Application Classes, continued*

```
   usersFile := BinaryObjectStorage onOldNoScan: (Filename named: 'users.bos') readStream.
   recArray := usersFile contents.
   usersFile close.
   recArray do:
      [
      :element |
      (element key key = aUser) ifTrue:
         [
         element value ifTrue: [ ^ true. ] ifFalse: [ ^ false. ].
         ].
      ].
   ^ false.

delete: aUser

   self class delete: aUser.

"Instance method not shown:  resetUserUpdate:"

BulletinboardSO class
   instanceVariableNames: ''

 BulletinboardSO class methodsFor: 'actions'

add: aUser

   UserList isNil ifTrue:  [ UserList := List new. ^UserList add: aUser. ]
              ifFalse: [ ^UserList add: aUser. ].

delete: aUser

   UserList notNil ifTrue:
      [ | newUserList |
      newUserList := List new.
      UserList do:
         [
         :element |
         (element = aUser) ifFalse:
            [ newUserList add: element. ].
         ].
      UserList := newUserList.
      ].

resetUserSemaphore

   "Initialize the UserSemaphore class variable with the following line as the first statement in "
   "DSTControlPanelORB>>initializeRequestBroker:"

   "BulletinboardSO resetUserSemaphore."

   ^UserSemaphore := Semaphore new signal.

search: aUser

   UserList notNil ifTrue:
      [ UserList do: [ :element | (element = aUser) ifTrue: [ ^true. ]. ].
      ^false. ].
   ^false.

userSemaphore

   ^UserSemaphore isNil ifTrue:   [ UserSemaphore := Semaphore new signal ]
                        ifFalse: [ UserSemaphore ].

"Create a Bulletinboard object on start up by inserting the following statements into"
"OfficeSO(class)>>exampleMe: just before the last return statement"

"o createChild: BulletinboardSO getInstanceACL title: 'Bulletinboard Retrieval Service'."
"BulletinboardPO maxInstances: (BulletinboardPO allInstances size + 1)."
```

generate a generic template for a module and its interfaces within the client area of the *System Browser* or *System Full Browser* window.

Every template will have a system-generated UUID (*#pragma IDENTITY*) for each of the interfaces. Each interface can also be subclassed from a base interface. For example,

```
interface BulletinboardPres : Presentation
```

means that interface *BulletinboardPres* inherits all of the declarations of interface *Presentation* (which is the collection of IDL operations for the *DSTPresenter* class).

In IDL, a derived interface may redefine inherited constructed types, constants, and exceptions. However, the inheriting interface may not redefine or override attributes or operations.

Within the body of each of the interfaces are the names of Smalltalk selectors and their IDL equivalents. For instance, we have the following:

```
#pragma SELECTOR = checkUserUpdate:
boolean     checkUserUpdate(in string aUser);
```

The IDL operation called *checkUserUpdate* takes a single argument of *string* type and returns a *boolean* type. The operation maps to Smalltalk instance method *BulletinboardSO>>checkUserUpdate:*.

In IDL, the *mode* of a parameter indicates its direction of movement. An *in* parameter means that the value is passed from client to server; an *out* parameter indicates that the value is passed from server to client. An *inout* parameter is bidirectional. The only argument to operation *checkUserUpdate* is an *in* parameter.

The IDL has a number of basic types such as *char*, *float*, *boolean*, *short*, *long*, and *octet*. The language also allows the programmer to build enumerated types, discriminated unions, and structs similar to their C language equivalents.

The developer can get assistance in the writing of the IDL operation declarations by sending *asIDLDefinition* to a class name. For example, a skeletal interface for class *BulletinboardPO* can be gotten by highlighting

```
BulletinboardPO asIDLDefinition
```

within a workspace window and executing **do it**. A skeletal interface of all the instance methods (except *abstractClassId*) for *BulletinboardPO* would appear. At that point, the developer would remove any operations not intended for the Interface Repository. Furthermore, he would specify the appropriate types and modes for the parameters of the remaining operations. The amended text is then copied and saved into the appropriate area of the *DSTRepository* browser window.

The Flow of Control Between the Presentation and Semantic Objects

In order to design the bulletinboard application to function properly, we must have an understanding of the interaction between the *BulletinboardPO* and *BulletinboardSO* objects. HPDST is an environment where events happen in a certain order. After the user has opened the remote *Information Site Services* window and double clicked on the *Bulletinboard Retrieval Service* icon, the following events take place:

The remote *Information Site Services* window is aware that its child object, the *Bulletinboard Retrieval Service* (a *BulletinboardSO* object), was selected and an *oOpen* message is sent to the folder. The folder is actually of class *FolderPO*, which inherited *DSTcollectorPO>>oOpen*.

Within the body of *DSTcollectorPO>>oOpen*, the key statements are:

```
po := info tail
      createPresentation: self
      types: #()
      session: Session
      access: #read_write
      auto: true.
po attachWindow: Session.
```

Within the first statement, a number of activities take place. On the right-hand side of the assignment operator (:=), *info tail* is the folder's way to get an instance of the semantic object (*BulletinboardSO*) based on the user's selection. The *createPresentation: types: session: access: auto:* keyword is an instance method of class *DSTSemantic*, which is inherited by *BulletinboardSO* (via *DSTapplicationObject*). The instance of *BulletinboardSO* then uses *createPresentation: types: session: access: auto:* to create a *BulletinboardPO* object.

As part of the PO creation process, the SO registers this particular instance of the PO (*DSTSemantic>>presenterAdd:*). In turn, *DSTSemantic>>presenterAdd:* calls *DSTSemantic>>update Presenter:* to notify its newly created PO of any events of in-

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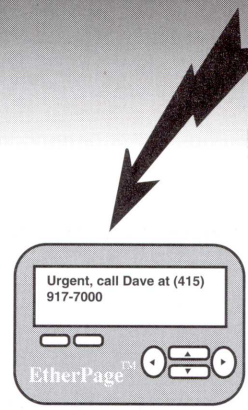

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CIRCLE 22 ON READER SERVICE CARD

LISTING 2 *Bulletinboard IFs*

```
DSTRepository methodsFor: 'bulletinboard IFs'

// Bulletinboard
// This module defines the types and interfaces which form the newModuleName
//  protocol or service.
//
module Bulletinboard {

      // This interface defines the abstract behavior of anInterface objects
      //
      #pragma IDENTITY = 6bb51563-e997-0000-020f-0328dd000000

      interface BulletinboardPres : Presentation  {

      #pragma SELECTOR = getDisplayId
      string        getDisplayId();

      #pragma SELECTOR = getUserId
      string        getUserId();

      };

      // This interface defines the abstract behavior of anInterface objects
      //

      #pragma IDENTITY = 6bb51563-e999-0000-020f-0328dd000000
      interface BulletinboardSem : ApplicationSem  {

      #pragma SELECTOR = checkUserUpdate:
      boolean             checkUserUpdate(in string aUser);

      #pragma SELECTOR = resetUserUpdate:
      void          resetUserUpdate(in string aUser);

      #pragma SELECTOR = delete:
      void          delete(in string aUser);

      };
};
```

terest. Since *BulletinboardSO>>updatePresenter:* was defined, *BulletinboardSO>>updatePresenter:* is what gets executed since it overrides *DSTSemantic>>updatePresenter:*.

In *Listing 1*, *BulletinboardSO>>updatePresenter:* determines whether the user is already using the application. If not, the semantic portion records him in a list of active users. This list may be inspected by the ORB administrator to monitor usage by executing *BulletinboardSO classPool inspect* in a workspace window.

At this point, the right-hand side of the first statement is complete. The instance PO is retained in variable *po* through the assignment operator (:=).

The *po* variable (which has a *BulletinboardPO* object) then proceeds to render itself as a window on the physical screen with the *attachWindow:* method. This instance method is defined in class *DSTPresenter>>attachWindow:* and is inherited by class *BulletinboardPO*.

Finally, the last action of *DSTPresenter>>attachWindow:* is to call the *BulletinboardPO>>open* method, where the dialog box is built, made visible, and initialized with the product listings of file *prodbbs.bos*.

New Approaches for a Changing World

For a software developer who has spent many years in a function-driven world, my initial entry into CORBA objects with Smalltalk was something of a "cultural shock." I felt I was living in a foreign land with not only a different language but also different cultures, customs, and philosophies. The Smalltalk environment enforces the object-oriented paradigm. Fortunately, with time, it is possible to become very comfortable and productive with this new life style.

The fundamental philosophy of Smalltalk is to give the developer essentially everything he needs to create a solution. His challenge is to find what he needs and reuse it in his solution. In addition, he should think about whether his own contributions could be reused by others. This is in stark contrast to the traditional practice of reinventing data structures and functions for every new software project.

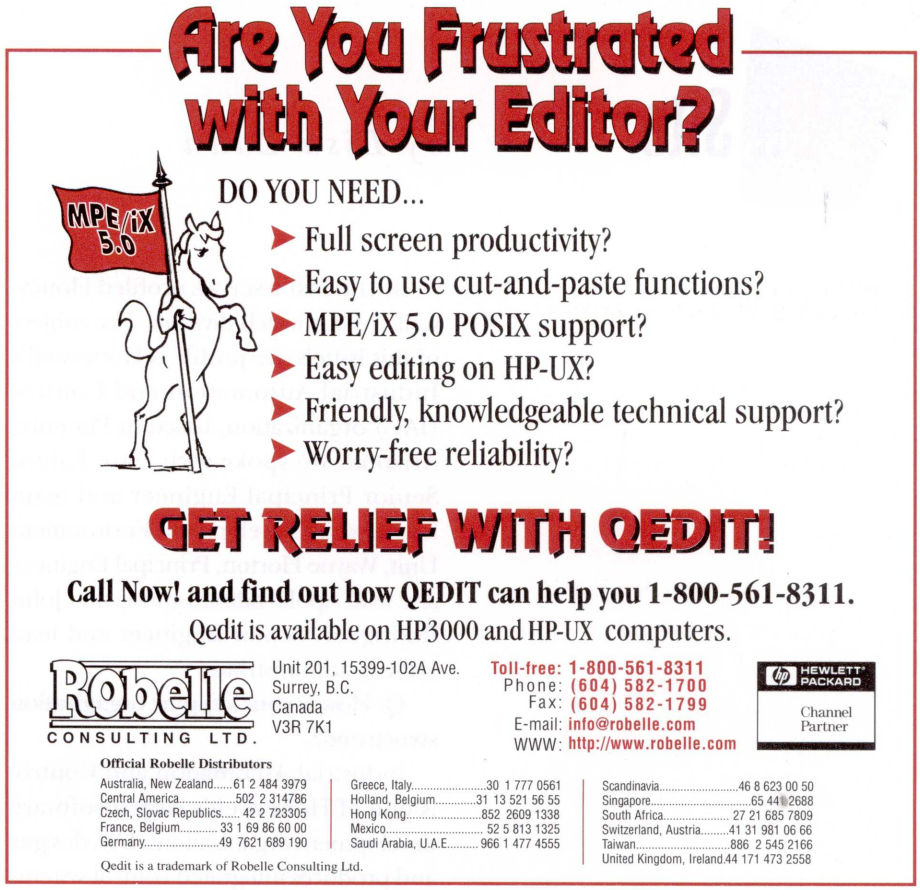
One of the greatest benefits of CORBA is that application developers are insulated from having to worry about the details of the network protocol and low-level interfaces (such as sockets). Furthermore, the Object Request Broker handles all of the responsibilities of message routing, marshaling, and object location. This allows clients and objects to be totally decoupled so that changes to one will not necessitate a change to the other.

In addition to the official OMG specifications, HPDST provides the presentation-semantic split paradigm, which con-

ceals the details of distributed object management. This paradigm enables application developers to work at higher levels of abstraction and allows them to devote the bulk of their attention to solving real-world problems.

With information access over the network becoming more prevalent, HP Distributed Smalltalk promises to play a major role in communicating among heterogeneous platforms. There are always growing pains in the learning of a new technology. However, once the technology has been mastered, the possibilities are limited only by one's imagination. ◧

Frederick F. Chew is a software design engineer in HP's Professional Services Organization. He is currently composing an HP Press book entitled Building CORBA Applications with HP Distributed Smalltalk, *which is expected to be published early next year.*



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On Site

by Lisa Zahn

IN THE LAST ISSUE WE profiled Honeywell's MicroSwitch division. The subject of this issue's site profile is Honeywell's Industrial Automation and Control (IAC) organization, based in Phoenix, Arizona. We spoke with Dave Eaton, Senior Principal Engineer and team leader of the Development Environment Unit, Wayne Horton, Principal Engineer and lead Apollo administrator, and John Rodriguez, Senior Engineer and lead HP-UX administrator.

Q: How is your support organization structured?

Industrial Automation and Control is one of Honeywell's largest software development organizations. IAC designs and produces integrated control systems for a variety of industries. Our support organization is part of engineering. There is a separate IT organization that supports the business PCs and the network infrastructure.

Our group is divided into two different units: the Development Environment and Development Facilities. The Development Environment Unit (DEU) is responsible for the evaluation, development, and support of software tools that are used to assist engineers in product development on multiple platforms. The Development Facilities Unit (DFU) is responsible for system administration of all engineering computing systems. DFU is divided even further into four main parts: UNIX administration, configuration management administration, NT/PC administration, and network administration. (Note that in most cases, when we say "UNIX" we are including HP-UX, Apollo Domain/OS, and non-HP platforms.)

Q: Do you distinguish between operations and analysts/engineering functions?

Yes, we support only the engineering environment and a few business applications that IT does not support. IT provides nearly all the support for the business machines.

Q: How many support people do you have for how many users?

There are 15 people (some specializing in one platform and some serving multiple platforms) who among them provide tools, support, and administration for about 200 to 300 users.

Q: Does anyone carry a beeper or do second shift/third shift support?

Most members of our staff carry a pager. Although there is no second or third shift, we are responsible for supporting people working off-hours and weekends as well as supporting some people off-site and in other time zones.

Q: What administrative areas do you support?

We support general operating systems for all UNIX systems, including OS loads, patches, tuning, and customizing.

We are responsible for the installation and support of all layered applications, including public domain utilities directly used for product development and related activities, though those receive a reduced, more background level of technical support. We support printer/plotter queues, perform backups, and manage the UNIX accounts.

We provide support for end users via an in-house help desk utility; users directly input requests and questions, which route to the proper administrator. The help desk utility runs on a Scopus/Sybase database and we have a World Wide Web interface, which enables anybody, regardless of platform, to issue a help desk request from his desktop.

The IT organization and a network services group share control of the network hardware. Network balance and

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CIRCLE 111 ON READER SERVICE CARD

configuration are controlled by both system admins and the network services group. Network services monitors our networks and informs us of trouble spots. For hardware support, Honeywell IAC has its own service organization that supports our desktop workstations and peripherals. The servers are supported by the appropriate vendor. IT configures and administers firewalls.

Q: What kinds of applications run in your environment?

There are two distinct product groups here: hardware development and software development. Hardware development groups run electrical and mechanical CAE/CAD applications such as Mentor Graphics products and ProEngineer. Software development uses products such as SoftBench, Atria's ClearCase, and Objectstore. We primarily use Z-mail for our UNIX-based mail front-end.

Q: What kind of computers and operating systems do you support in your environment?

Our group supports all development computers in engineering, including both HP and non-HP equipment. The non-HP equipment includes personal computers running a variety of different operating systems from several vendors. The HP equipment includes old Apollo DN3000s up to the latest HP K Series.

Q: Can you describe a typical desktop system in your environment?

As far as our HP platforms are concerned, this depends upon the product group. For the hardware development group, the desktop is usually high end (735/125) to moderate (715/100) with plenty of RAM, generally 128 MB to run the CAE/CAD tools, and some with graphics accelerators. All of these desktops have 19-inch to 21-inch color monitors. For software development, the desktop is predominantly low-end workstations (720 and 715/33) with about 32 to 48 MB RAM and 19-inch color monitors. Some groups use high-end compile servers (J200) with 256 MB RAM.

The Apollos are primarily used for software development and most are configured with monochrome monitors and about 24 MB RAM.

Q: Do you support non-workstation platforms on the desktop?

A number of development groups have only Windows/NT workstations on the desktop. Within our group, there are a number of NT admins who support these users. Most of these users, however, require connectivity to the HPs; to do this, they are using an X package such as ReflectionX or EXceed.

Q: Does your environment use central file servers and compute servers for shared resources, or is your environment widely distributed?

On the Apollo network, data is distributed throughout the network and resources are shared across the network. Our UNIX environment is more of a client-server model. User data is stored on central file servers. The individual desktop machines are used for computing, although we have several compute servers as well. The majority of our file servers are 700-class workstations, but we are migrating these servers to 800-class file servers. We currently have H60s and K200s.

Coming from an Apollo background, we are used to a distributed environment, where resources can be spread across the network, but this is much harder to accomplish in an NFS environment. A client-server model is much more practical in this environment.

Q: What's your printer environment like?

We use the native *lp* spoolers for UNIX systems and *prf* for the Domain/OS systems. On the Apollo, network printers are connected directly to a workstation. Apollo print services are used the majority of the time, but all Domain/OS nodes are running *lpd*. The UNIX printers are network-based printers with a couple of central print server nodes; the desktop workstations spool to these nodes, which spool directly to the printers. We are moving toward allowing all desktops to print to the printers on all UNIX systems regardless of the platform.

Q: What does your network look like?

We are in the process of revamping our network here in Phoenix into a three-tier model. Tier 1 is the file server, tier 2 consists of compute and login servers, and tier 3 consists of the desktop nodes. Tier 1 and tier 2 are on switched 100MB FDDI, and tier 3 will be shared 10 MB with power users using dedicated 10 MB connections.

The three-tier model allows us to move to a flat network, where all engineering will be on the same subnet, thus eliminating the need for routers for local traffic.

Q: Does your site have physical Internet connectivity?

We have a T1 line that connects our location to the corporate headquarters. Access to the public Internet is provided from that location.

Q: What communications services do you support between your users and between your users and their associates?

We support e-mail services, ftp, World Wide Web, and modem dial-up access for all of engineering. To allow access from home or other off-site locations, we have a bank of terminal servers and we provide users with Windows-based SLIP/PPP software if they require it. SMTP is the mail protocol used, although we support POP for some of the NT users. We have a Web server that is only accessible internally; a public Web server is available outside of our physical network, at *http://www.iac.honeywell.com.*

Q: Can you describe your backup strategy?

Full backups are performed once a week, and incremental backups are performed daily; we do a combination of fulls and incrementals each day. Each server has a full backup done once a week and the remaining days are level 3 incrementals (incremental since last full). Our backup software is from Workstation Solutions writing to 8mm tapes. We use 10 tape autochangers for unattended backups.

Apollo backups and UNIX backups are done separately, although for both we are using Workstation Solutions backup utilities. Effective use of sophisticated SCM software reduces the need for most restores due to lost files and provides a sort of "on-demand" backup function for the developers.

Q: How do you authenticate your users on your networked computers?

For the Apollo users we maintain the Domain/OS registry. The UNIX password file is separate from the Apollo registry, but we try to keep the two in sync (no duplicate UIDs). We use NIS to keep passwd files on all UNIX nodes the same. Passwords are required to meet minimum corporate standards.

Q: What kind of training do you support for your users and do you yourself participate in? How do people in your organization get trained?

We currently provide limited training to users. As Apollo users start to migrate to HP-UX, we will revise and adapt the "new user" class we had created when we first started using the Apollos, thus improving training for our existing HP-UX users as well. Informal one-on-one sessions with users are very common, and we have had HP and particular application vendors hold training classes in-house. People from our administration and support group attend the InterWorks conference regularly to gain new insights. ◧

Lisa Zahn is vice president of Ibis Communications Inc., a technical documentation and training consulting firm. She was one of the first five technical writers at Apollo Computer, Inc. and was a Learning Products manager at HP's Chelmsford, Massachusetts facility for several years before forming Ibis.

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CIRCLE 10 ON READER SERVICE CARD

Internet Goodies

by Joseph Berry

MISC

CVS 1.4

It used to be that the art of writing software consisted of knowing how to invoke the compiler, the linker, the debugger, and the editor and, of course, the actual writing of the program itself. This was particularly true when the project source code consisted of a handful of source modules under the control and ownership of one programmer.

Today teams of developers write very complex programs that must be built and tested on a variety of platforms. As I have previously mentioned, my company, Landmark Systems Corporation, writes UNIX performance tools. Our team of developers decided to use a package called CVS for managing the revision control facet of the development. CVS (Concurrent Versions System) is a package that sits on top of the RCS (Revision Control System) package. One of the major advantages of using CVS rather than RCS alone is that I can refer to a group of files together, checking them all in and out with a single command. It is like a super-RCS. The command set is very straightforward and fairly minimal. It comes with extensive documentation and is easy to build.

Application developers who find RCS inhibiting should examine CVS. The software runs on a large variety of computers including DECs, HPs, IBMs, and Suns. The software is available from wherever you access your GNU software (*prep.ai.mit.edu*, *gatekeeper.doc.com*, etc).

ODE v 2.3.4

Whenever you find one revision control system, you will find a second one. Recently, the Open Software Foundation (OSF), the makers of Motif, OSF/1, and DCE, released to the world a package called the OSF Development Environment (ODE). This release is "unencumbered and freely redistributable."

Admittedly, I have never used ODE. But, you must remember, OSF programmers use it for all of their software development; and they write lots of big code! I downloaded the documentation and perused it.

ODE's philosophy is somewhat different from the way CVS works. CVS does not supply you with a built-in make engine and compile environment. ODE does. Depending on your philosophy or outlook on developing software, you might find ODE better or worse. By the way, underneath the covers, ODE also uses RCS.

To get a copy of ODE, do an anonymous ftp to *riftp.osf.org* and *cd* to */pub/ode*. To check out the documentation first, do a *cd* to the *doc* directory and get a copy of either *UsersGuide.ps.Z* (a compressed, formatted, PostScript file) or *UsersGuide.txt*. Source and binary files are also available.

COMP.UNIX.SOLARIS

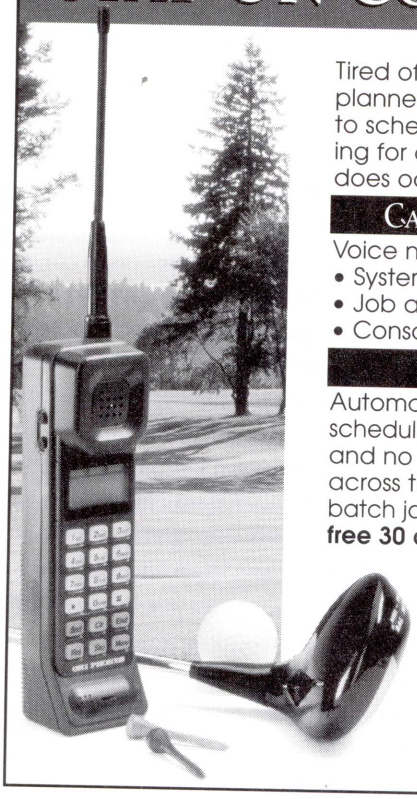
NEdit v 4.0

Information about NEdit was posted on a variety of newsgroups but no HP-UX newsgroup. Nevertheless, according to the documentation at least, this software does compile and run on HP-UX systems.

NEdit is a GUI-based text editor for X/Motif systems. It is easy to use and fully takes advantage of the mouse and the window manager. Other features include multiple levels of undo, cut and paste with other Motif programs, and all sorts of goodies for programmers, such as auto indenting, parenthesis flashing and matching, and directly going to the lines that the compiler errors point to.

Sources and executables (including HP-UX) are available via anonymous ftp at *ftp.fnal.gov* in the */pub/nedit/v4_0* directory.

STAY ON COURSE! WHILE WE DO THE MONITORING



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CIRCLE 164 ON READER SERVICE CARD

Also available is a Web page for NEdit at: *http://fnpspa.fnal.gov/nirvana/nedit.html.*

COMP.SYS.HP.HPUX

rdist v 6.1.2

A useful systems administration tool, rdist is a utility that makes identical copies of files onto multiple hosts. This software comes from the University of Southern California. A number of security-related enhancements have been included in this release of the software including the ability to compile and run on Linux computers. To get a good understanding of the software, you should download a paper titled "Overhauling Rdist for the 90s" from the USENIX LISA VI conference. It is available via anonymous ftp on *usc.edu* as */pub/rdist/overhaul.ps.gz.*

The software itself is in the same directory in the file *rdist-6.1.1.tar.gz.*

sysinfo v 3.1

The University of Southern California is also responsible for this gem of a program written by Michael Cooper (*mcooper@usc.edu*). As the README file says, "Sysinfo is a program which shows various pieces of information about the hardware and operating system software configuration of the host it's run on." This program is reminiscent of DOS sysinfo programs that simply dump out as much information about the computer as possible. The program compiles very easily on loads of different platforms.

The most recent version of sysinfo is available via anonymous ftp from the system *usc.edu* in */pub/sysinfo.*

ALT.SOURCES

drat v 0.1

If you don't mind using beta quality software, you might want to look at this program. Drat is an object-oriented interface to the curses programming library written in C++. Curses is a screen manipulation package providing extensive controls of the cursor, character-based screens, and various editing facilities. It is included with virtually every UNIX operating system on the market.

If you don't need to write an application using a GUI, but you want pretty looking character-based output, you should probably be using curses. Curses understands many, many different kinds of terminals; it includes a database of terminal commands for doing various things–clearing the line from the current cursor position, scrolling the page, etc. While not difficult to use, curses has many idiosyncrasies (which is why some people say that the name is very descriptive).

Scott Murman has developed a C++ interface to the curses library. The package includes not only the standard user interfaces but also form-based classes to handle some common user interfaces: menus, input forms, and output forms. The implementation follows the X Window paradigm (using callbacks). For a more complete description of the software, check out the Web page at *http://www.best.com/~smurman/Drat.* The

software itself can be downloaded either from the same Web page or from *ftp.best.com* at location */pub/smurman/Drat.*

Web Page Software

I finally decided to do it–to make my own Web page. Yes I know it's vain, but it seemed like so much fun. I am not going to discuss the details of creating html documents; many books have been written on this subject and many articles have been published. I will present instead some interesting and useful software that you might wish to take advantage of when building your Web pages.

httpd v 1.5

The most fundamental piece of software you must have on your system is a Web server. This is the program that listens for requests from user-operated browser software such as Netscape and Mosaic. Requests typically come in on port number 80. The page requested is then returned to the browser software.

There are many server packages available. They range from the high-end commercial products to low-end programs as basic as a 200-line Perl program. I use httpd, the original and possibly the most popular server from the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign. This software is in the public domain.

httpd comes with extensive documentation and compiles in a very straightforward manner. Essentially, one configures the software via a couple of configuration files that define, among other things, which directory is to be considered the "root" Web directory. httpd can be brought up either manually or via the *inetd* daemon. It then continues to run by itself, waiting for external Web requests to process. The software is available from the host *ftp.ncsa.uiuc.edu*. Look in directory */Web/httpd/Unix/ncsa_httpd*. You'll see a *documents* directory where the extensive documentation set can be found. The software itself lives in directory *httpd_1.5*. An NCSA httpd home page also exists from which the documentation as well as software can be downloaded. The address is *http://hoohoo.ncsa.uiuc.edu/*.

fly v 1.3

fly is a program by Martin Gleeson that generates GIF images "on the fly." In reality, fly is a command-file interface to the included program, gd, developed by Thomas Boutell. To create a colored circle using fly, you would enter the line "circle *x,y,r,R,G,B*" where *x,y* represent the coordinate of the center of the circle of radius *r* with the color of *R,G,B*.

fly can be obtained via the Web page at *http://www.unimelb.edu.au/fly/fly.html*. The main reason fly is mentioned here is because the next package requires it.

counter v 1.1.1

Have you ever noticed the neat little counters that appear on some Web pages indicating how many people have accessed the page? This program supplies all the functionality to add a counter to your own Web pages. The counter program is just one of several useful Web-oriented utilities that Matt Wright has developed. Matt's utilities can be accessed via the Web page *http://www.worldwidemart.com/scripts/*.

The counter program requires the fly package described above. It comes with two Perl programs, one of which is the counter program itself and the other a program that produces a nice HTML file of the contents of the *access_log* file so you can see (via a Web browser) who has previously logged into the system. It's very nice.

One other piece of software will be required before the counter program is fully functional. The program does not include any graphical digits (as opposed to ASCII digits which the program does not use). However, Matt included a Web site address where hundreds of different styles of digits can be found. I never knew there was such a subculture of digits fanatics. At any rate, go to *http://cervantes.comptons.com/digits/digits.htm* and download at least one set of digits to implement the counter program.

If you're interested in seeing what I have put together, take a look at my Web page, *http://wayne.unix.landmark.com*. But please, no nasty comments. I don't do Web pages for a living.

Web Pages

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Now this is a nice site. And even better, it is basically still free. This is the Web site for *The New York Times*. It offers news, feature articles, classified ads, and other features.

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If you live in the U.K. or have lived in the U.K. or just want to know what the news from London is like, try out this site. It is the home to the newspaper, *The Times* of London. I was recently in London on business and since then have made a point of periodically taking a look at the "local" news. ◧

Joseph Berry is a senior software developer at Landmark Systems Corporation in Vienna, Virginia. He is one of the authors of Landmark's performance monitor, TMON for UNIX. A former HP 3000 systems specialist for Hewlett-Packard, he has been in the computer industry for more 20 years. He can be reached at joe@landmark.com.

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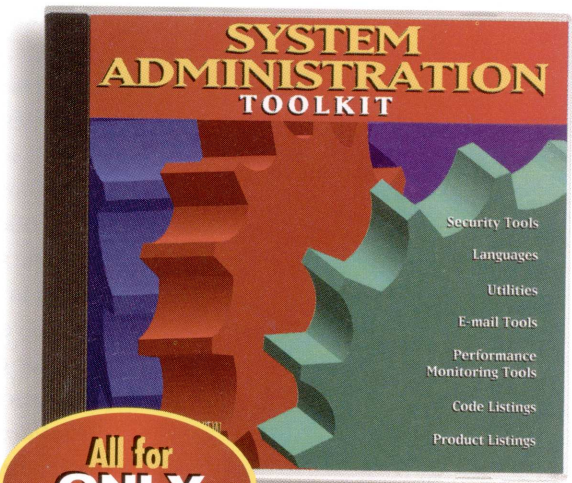

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CIRCLE 131 ON READER SERVICE CARD

X-Watch

by Larry Headlund

Lists

I HAVE SPENT THE last couple of columns on tools for driving shells from X/Motif programs. Now I want to look at the feeding of X programs from the shell. What X programs are usually hungry for is data and, as always with UNIX and X, there are several ways to accomplish our task.

Resources

The kind of data I'm looking for is used to populate Lists and related lifeforms such as SelectionBoxes and ComboBoxes. I don't want to hard-code the elements in my programs–that is usually a bad idea. Unless, of course, you like keeping source code remotely and doing compiles for every customer change, or sending executables by wire or messenger and keeping distinct executables maintained for every site. No, data is very much the presentation layer and should be kept at arm's length from the code. If not further.

The simplest way is to set the list contents in a resource file. All the code to retrieve and manipulate is in the Xt toolkit or in Motif. Typically there are two resources with names *XmNitems* and *XmNitemCount* to control things. X itself will take care of internationalization and custom configurations on a per user basis with its usual *LANG* variables or *XAPPLRESDIR*.

This is fine for stable data, data that stays fixed at a site or for a user. It is not so fine for data that is dynamic or secular. For slowly changing data, say a list of printers, the first problem is synchronization. If you add or delete a printer, the file with the resource specification must be updated at the same time. Anyone want to guarantee this will always happen?

The second problem is editing the resource file itself. The syntax of resource files is not complicated, but for an occasional user there are a couple of pitfalls. For entering a list, the common mistakes I have made a hundred times myself include not terminating each member with a comma, forgetting to put a backslash when continuing the list to a separate line, leaving spaces after the backslash, and setting XmNitemCount incorrectly. The last is a really fun error, leading to core dumps and memory errors. Anyway, I always feel odd sitting in front of a computer and manually counting the number of items in a list.

All these problems are magnified when the data is dynamic. If you want users to select from a list derived from a database, for example, they (or the administrator) first have to query the database with whatever tools they have, these days usually SQL or a reasonable facsimile–not the way to convince users of the simplicity and ease of use of X. It gets even worse when the data changes while the application is running. Suppose you want your program to remove an item. Resource files are read only when the application starts. There is no way, using resource files alone, to have your program reflect those deletions or additions.

Reading Data from Files

My first thought was to pass the name of the file to be read to a function and have the function populate the list. I assumed that the target file would be a carriage return delimited file with one list element per line. This matches well with the standard output of an SQL query and many other programs. I needed a function that took a file name argument and read it into a List. Wcl, my preferred tool, lets you specify file

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LISTING 1

```
/* setting a XmList from a file name */

#define MAX_LENGTH      512     /* maximum list item length */

void setListFromFile(
Widget  widgetList,
char* strFileName,
caddr_t unused)
{
        FILE*  file = (FILE*)0;
        int    c = '$';

        if (strchr(strFileName, c)) { /* use shell to expand */
                FILE*   pfile = (FILE*)0;
                char    strCommand[MAX_LENGTH];
                char    strFullName[MAX_LENGTH];

                (void)sprintf(  strCommand,
                                "echo %s",
                                strFileName);
                if (pfile = popen(strCommand, "r")) {
                        if (fgets(strFullName,
                                        MAX_LENGTH,
                                         pfile)) {
                                strFullName[strlen(strFullName) -1] = '\0';
                                file = fopen(strFullName, "r");
                                }
                        (void)pclose(pfile);
                        }
                }
        else {
                file = fopen(strFileName, "r");
                }
        if (file && widgetList) {
                char            line[MAX_LENGTH];
                XmString        stringLine;

                {       /* delete any existing items */
                        int     itemCount;

                        XtVaGetValues(widgetList,
                                        XmNitemCount,
                                        &itemCount,
                                        NULL);
                        for(; itemCount > 0; )
                                XmListDeletePos(widgetList,
                                                --itemCount);
                        }
                while (fgets(line, MAX_LENGTH, file)) {
                        line[strlen(line)-1] = '\0';
                        stringLine = XmStringCreate(line,
                                        XmSTRING_DEFAULT_CHARSET);
                        XmListAddItem(widgetList,
                                        stringLine, 0);
                        XmStringFree(stringLine);
                        }
                }
        if (file)
              (void)fclose(file);
        }
```

LISTING 2

```
/* setting a SelectionBox from a file name */
void setSelectionListFromFile(
Widget  widgetSelection,
char* strFileName,
caddr_t unused)
{
       setListFromFile(XmSelectionBoxGetChild(
                              widgetSelection,
                              XmDIALOG_LIST),
                       strFileName,
                       unused);
       }
```

name arguments in a resource file thus:

```
*widgetname.WcCallback: setListFromFile(filename)
```

You can accomplish the same result by having a line such as

```
*widgetName.filename:   filename
```

and a call in your function such as

```
XtVaGetValues(widget,"filename, strFilename, NULL);
```

in your code.

Continued on Page 68

LISTING 3

```
/* setting an Interleaf ComboBox from a file name */

static void ComboBoxFromFile(
Widget  widget,
FILE*   file)
{
        if (file && widget) {
                char           line[MAX_LENGTH];
                XmString       stringLine;
                {       /* delete any existing items */
                        int     itemCount;

                        XtVaGetValues(widget,
                                      XmNitemCount,
                                      &itemCount,
                                      NULL);
                        for(; itemCount > 0; )
                                DtComboBoxDeletePos(
                                        (DtComboBoxWidget)widget,
                                        --itemCount);
                        }
                while (fgets(line, MAX_LENGTH, file)) {
                        line[strlen(line)-1] = '\0';
                        stringLine = XmStringCreate(
                                      line,
                                      XmSTRING_DEFAULT_CHARSET);
                        DtComboBoxAddItem(
                                (DtComboBoxWidget)widget,
                                stringLine, 0, True);
                        XmStringFree(stringLine);
                        }
                }

        }
```

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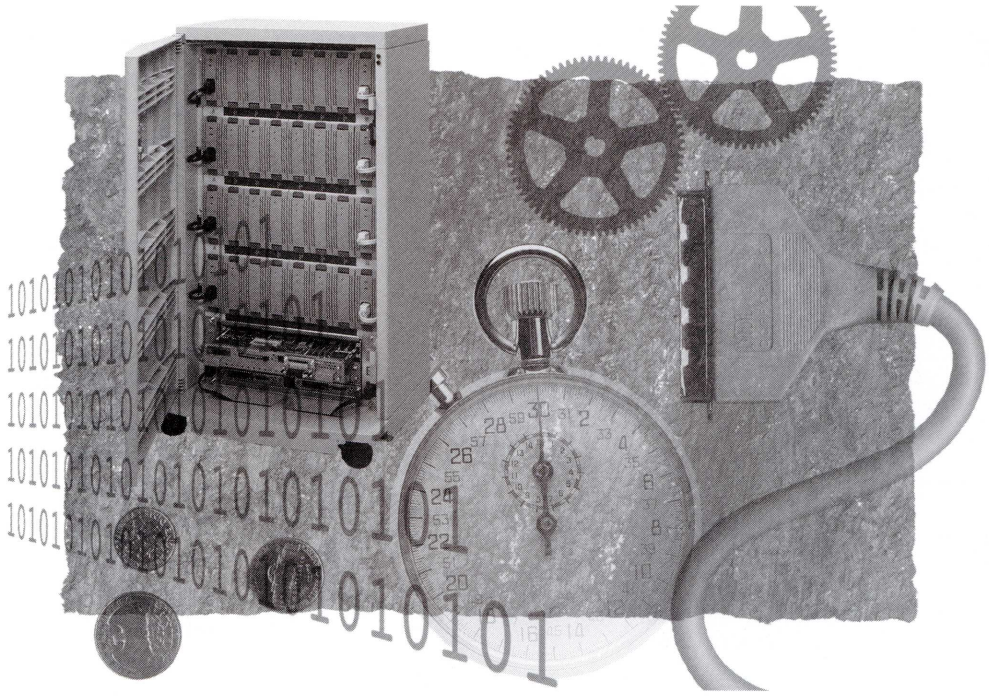

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LISTING 4

```
/* setting Lists from processes */

void setListFromProcess(
Widget  widgetList,
char* strProcessName,
caddr_t unused)
{
        FILE*    file = popen(strProcessName, "r");

        if (file && widgetList) {
                char            line[MAX_LENGTH];
                XmString        stringLine;
                {       /* delete any existing items */
                        int     itemCount;

                        XtVaGetValues(widgetList,
                                        XmNitemCount,
                                        &itemCount,
                                        NULL);
                        for(; itemCount > 0; )
                                XmListDeletePos(
                                        widgetList,
                                        --itemCount);
                        }
                while (fgets(line, MAX_LENGTH, file)) {
                        line[strlen(line)-1] = '\0';
                        stringLine = XmStringCreate(
                                        line,
                                        XmSTRING_DEFAULT_CHARSET);

                        XmListAddItem(widgetList,
                                        stringLine, 0);
                        XmStringFree(stringLine);
                        }
                }
         if (file)
                 (void)pclose(file);
         }

void setSelectionListFromProcess(
Widget  widgetSelection,
char* strProcessName,
caddr_t unused)
{
        setListFromProcess(XmSelectionBoxGetChild(
                                widgetSelection,
                                XmDIALOG_LIST),
                        strProcessName,
                        unused);
        }

void ComboBoxFromFile(
Widget  widget,
```

Continued on Page 69

My first function to accomplish this is in *Listing 1*. I needed similar functions for a SelectionBox and the contributed Interleaf widget the ComboBox (*Listing 2* and *Listing 3*).

Lists from Processes

I quickly realized I didn't have a complete solution. File names are fine but they are so *specific*. To go back to the original example of a printer control program, there isn't a convenient file with the names of the printers listed for you, although the program *lpstat -v* gives you the names of the printers. I also found that even when a file was maintained, I needed to massage it, usually with *awk*, before it was suitable for a list. For database access I needed to run SQL and massage. So I wrote similar functions that took an argument of a program to run. (*Listing 4*)

This had the advantage of allowing customizing outside the GUI program. If a user needed nonstandard input for his lists, changing his PATH and placing the data supplying programs in the appropriate directory took care of it.

All this has worked so well that I seldom specify a list's items explicitly in a resource file anymore. ◧

Larry Headlund is president of Eikonal Systems, a software development company specializing in the optical industry and a consultant on UNIX and X. He has been working with commercial UNIX since 1982 and with HP-UX since 1984. He can be reached at lmh@world.std.com or (617) 482-3345.

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LISTING 4 *continued*

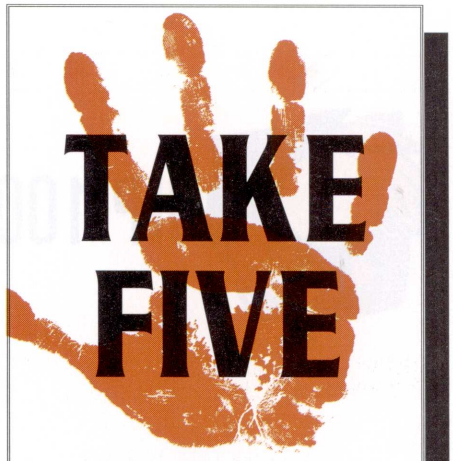
```
FILE* file)
#endif
{
      if (file && widget) {
              char                line[MAX_LENGTH];
              XmString            stringLine;

              {         /* delete any existing items */
                        int      itemCount;

                        XtVaGetValues(
                                widget,
                                XmNitemCount,    &itemCount,
                                NULL);
                        for(; itemCount > 0; )
                                DtComboBoxDeletePos( (
                                        DtComboBoxWidget)widget,
                                        --itemCount);
                        }
              while (fgets(line, MAX_LENGTH, file)) {
                        line[strlen(line)-1] = '\0';
                        stringLine = XmStringCreate(
                                        line,
                                        XmSTRING_DEFAULT_CHARSET);
                        DtComboBoxAddItem(
                                (DtComboBoxWidget)widget,
                                stringLine, 0, True);
                        XmStringFree(stringLine);
                        }
              }
        }

void setComboBoxFromProcess(
Widget  widget,
char* strProcessName,
caddr_t unused)
{
        FILE*     file = popen(strProcessName, "r");

        if (file && widget) {
                ComboBoxFromFile(widget, file);
                }
        if (file)
               (void)pclose(file);
        }
```

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CIRCLE 101 ON READER SERVICE CARD

HP 1000 Guru

Q: How much smaller than an A900 system file is an A990 system file? I am tight on OS space and wonder whether upgrading to an A990 will help.

A: It depends on whether the A900 is using the Rev 4 Base Set or not. If the A900 has the latest (Rev 4) Base Set firmware, then the system gen should contain the following two RPL files: %RPL91 (or %RPL90) and RPL_A900_REV4.REL. This fully implements all A900 firmware code. In this case, updating to an A990 system gen will *not* gain any OS space because the A990 RPL, RPL_A990_CDS.REL (or RPL_A990.REL), is not any smaller.

If you do not have the Rev 4 A900 Base Set, and you are using XMB.REL in the system gen, then updating to an A990 will gain you 241 words. This is the difference in size between the RPL_A990_CDS.REL and (%RPL91 + XMB.REL).

Q: Does the PASCAL compiler have a line length limit? I seem to run into problems when my lines exceed 80 characters. I see no method for continuing lines as in FORTRAN using column 6.

A: The HP 1000 PASCAL compiler defaults to a line length of 80 characters. This can be changed with the compiler directive (option) *$WIDTH <char>*. "char" can be in the range of 1 to 150.

Q: My system seems to be filling up SAM rather quickly because of extremely high network broadcast traffic. I am not able to use the discard packet mode, because I am still running 5.27 NS. Is there something else I can do in the meantime, before I update to 6.2?

A: Yes. In the interim, you can modify the packet filtering performed on the LANIC. If your 1000 system is configured for both 802.3 and Ethernet packets, then NSINIT sets the packet filter to 6. This allows Individual, Multicast, and Broadcast packets to be received. You can change this value to 4, which will allow only Individual and Multicast addresses to be received. To change the packet filter use the following command:

```
cn <lu_of_lan_card> 37B p1 -20465
```

where p1 is the desired value, for example, 4. Make sure this command is done after NS/1000 has been initialized.

For more information, see the *12076A LAN/1000 LINK Node Manager's Manual* and the *12079A Direct Driver Access Manual.*

Q: What is the largest session number allowed by RTE-A?

The Relocatable Library manual under GETSN indicates that the session number

returned may be larger than 8 bits, but how much larger can it be? It seems I can pass any value I want when using CLGON to create a programmatic session.

A: The actual limit is 319. (Note that the minimum programmatic session number is LastLu+1.) GETSN will return an error (-1) if a value greater than 319 or less than (LastLu+1) is used.

The problem with CLGON is that it does not check the number being passed to it. It assumes the programmer has used GETSN and validated the number being used. This is why you can actually create programmatic sessions larger than 319. These sessions can lead to unpredictable behavior, including, in the worst case, a system crash.

A crash can occur under the following conditions:

1. You create a programmatic session greater than 319.
2. Your system size is just under 32,767 words.
3. You terminate the programmatic session.

A crash can occur under these conditions because RTE keeps a bitmap in the operating system to keep track of active sessions. This bitmap is allocated by RTAGN as 20 words. Coincidentally, it is the very last thing in the 32 pages of the RTE-A OpSys. These 20 words equal 320 sessions (20 x 16 = 320). When a programmatic session is created, GETSN is responsible for setting the appropriate bit in the bitmap. When a session is terminated, either by KILLSES or a call to RTNSN, this bit needs to be cleared. The operating system does not validate the session number, so it goes ahead and clears the appropriate bit. If the session number is greater than 320, the bit is above the allocated bitmap. And if the system is just below the 32,767 word limit, a memory wraparound can take place, and the A register (memory location 0) can be corrupted. This will crash the system. Not much fun to troubleshoot!

Q: I need to transfer a binary file that has a record length of 1,088 words from a PC to the 1000. When I transfer the file using binary mode, the file on the 1000 winds up with a record length of 128 words. How do I do this?

A: When transferring a binary file from a non-RTE machine, you must specify any desired file attributes. By default, FTP binary mode will create the target file as a Type 1, which means a fixed record length of 128 words. If you need a record length of 1088 words, you must specify a Type 2 file. For example:

```
ftp> bin
200 Type set to I.
ftp> get binary binary:::2::1088
200 PORT command successful.
150 Opening BINARY mode data connection for binary (2560 bytes).
226 Transfer complete.
2560 bytes transferred in 0.4 seconds   [ 64.0 kbytes/second ]
ftp>quit
```

The file on the 1000 will look like this:

```
CI> dl binary srn
directory  ::SYSTEM
     name    blks recs  rlen
BINARY        10    1   1088
```

Q: I recently needed to restore some files from an old FST backup. When I did a DL of the FST tape, it contained the same file, "8", repeated hundreds of times. How did this happen and what can be done to recover a specific file from this tape?

A: What happened here is that when the backup was created, the FST command used was probably something like this:

```
FST> BA /MYFILES/ 8
```

(Like a TF command, most likely.)

This is a legal FST BA command but the result is probably not what the user expected.

Here is the syntax for the BA command:

```
BAckup <mask> [<dest>] [<msc>] - Select files to backup.
       <mask> - mask descriptor for selection of disk files.
       <dest> - mask for destination file descriptor.
       <msc>  - system master security code.
```

The *<dest>* parameter can be any file mask. What this does is back up the files specified by "mask" and rename them "dest." In the example FST backup above, FST renamed all files in the directory */MYFILES* to "8" on the tape.

Older revisions of FST did not warn the user that the command entered would result in duplicate file names. Current versions of FST report the following if a BA command of the form:

```
FST> BA /MYFILES/ 8
```

is used. FST reports the following:

```
** WARNING ** destination mask for BA command yields duplicates names.
```

So that is what happened to create a tape with the same file name repeated. By the way, the intended usage of the *<dest>* parameter is for either of the following:

1. You are backing up a single file, and want the file name on tape to be different.
2. You want the directory path on the tape to be different from the source disk directory. For example:

```
FST> BA /SW/REV_6P2/NS1000/ /NS1000/
```

will back up all the files in the subdirectory *NS1000/* and put them on tape under */NS1000/*.

Now, as for recovering a particular file of the tape. Since all the file names on tape are identical, the only way to differentiate a particular file is by the contents itself. This means restoring all the files and then looking at the individual files with GREP or EDIT for known data. If the contents of the desired file are binary data of unknown origin, you are probably out of luck. Restoring the files can be a very time-consuming process. For example, here is a "bad" backup:

```
FST> dl
  Format      :  FST
  Title       :  @ temp
  Created     :  Wed Feb 14, 1996  1:36:46 pm
File paths and names
File
TEMP:::5:48:128
TEMP:::4:1:9
TEMP:::4:96:40
TEMP:::6:113:128
TEMP:::2:256:1024
TEMP:::4:96:36
```

In this case, you could restore a particular TEMP file by specifying the full name as follows:

```
FST> RE TEMP:::2:256:1024
1     files selected; 1 total
```

Obviously, this can be a very time-consuming process, and if there are multiple files with the same attributes, you'll have to play games with the D option, and perhaps perform a BR command to prevent overlaying a restored file that you want to save. At this point, it would depend on how badly you needed to recover the data. ◧

Walt Boeninger works in the HP Response Center in Mountain View, California. He has been supporting the HP 1000 for 15 years. His e-mail address is: walt@hpwrcxe.mayfield.hp.com

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UNIX REVIEW

Sys Admin The Journal For UNIX Systems Administrators

CIRCLE 125 ON READER SERVICE CARD

CSL Perspective

During one of my brief forays into "management," I spent two summers working as the program director at a Scout camp in central New York. The responsibilities included every aspect of the camp, its programs, staff, and facilities. The only thing I didn't do was the bookkeeping and food service. It was sort of like being the first officer on a starship.

The training for this assignment involved a week-long school where you learned some valuable skills–planning, leading activities, and keeping your staff productive. Two lessons have stayed with me over the intervening 20 years: (1) Be flexible and (2) Use your resources. As the years go by, I keep seeing instances of how both of these values have been key to effective leadership.

During the past year, I have been recalling these principles as I assume the responsibilities of managing production systems and services. I'm spending a considerable amount of time setting up several new systems that will form the backbone for some of our internal services such as e-mail, Domain Name Service, and the World Wide Web. Our support strategy is centered around building a so-called low maintenance environment where a system administrator can manage these systems remotely and with minimal daily intervention.

In order to pull this off, we've taken some off-the-shelf system management products and integrated them. We've gained significant advantages over the traditional management processes through the use of these tools and will probably continue using them in other environments. Unfortunately, one of the biggest negatives in the system management marketplace today is that no one package, or even several, can meet all the requirements for building and managing the kind of environments we wish to provide our users and customers. Vendors continue to make great strides in dealing with these growing and changing needs, but for the most part they've sacrificed flexibility along the way. Vendors just cannot anticipate many of the requirements that come up in an operational environment; being adaptable then becomes a key capability of a top-notch support staff.

In our current environment, the tools we work with have a lot of flexibility and adaptability, so we have the freedom to create additional capabilities to solve particular problems. By using public tools such as Perl, we can create monitoring functions that are specific to our environment. HP-UX, being a UNIX system, is inherently a flexible, adaptable system right out of the box. That is a very big benefit to me, especially when I've been under tight schedule pressure and have to get the system up quickly.

Another example, this time of "using your resources," is the monitoring of kernel table space. None of the tools I currently use will enable me easily to assess the current size of the file table.

On our Web server, files handles are being created, used, and returned at the rate of several thousand per hour. The only recovery strategy when the system runs out of this resource is to increase the size of the table in the kernel and reboot. What is needed is a way to monitor the table real-time and sound an alarm if it begins to approach full utilization. Through some digging I've discovered that the *sar(1)* utility can dump out the information I need in a format that is easily integrated with my monitoring system.

As I look back over the last year, I'm appreciating the fact that the open sys-

tems arena, with its operating systems, networking, services, and capabilities, offers some significant value over more closed, proprietary solutions. Also, having access to the large number of utilities and subsystems in the public domain empowers the support staff to maximize the capabilities of our systems. When I'm under the gun, it's a great feeling to be able to tell customers that problems have been fixed and systems are running at close to 100 percent. They don't seem to care much about how, just that it's done. If I didn't have a flexible, adaptable system to work with and only a limited collection of software and skill resources, I'm sure we would not be nearly as successful. ◧

Paul Gerwitz is chairman of the CSL committee and a Senior Technology Specialist at Eastman Kodak Company in Rochester NY. He can be reached at 716-477-3067 or by e-mail at gerwitz@interex.org or gerwitz@kodak.com.

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CIRCLE 140 ON READER SERVICE CARD

Industry Watch

WELL, IT'S THAT TIME again. Election fever is breaking out all across the U.S. with 30-second sound bites to beat the band (or beat on one's opponent, more likely). There is relief, though, for those of us who want more than the demo/psycho/geographically hewn non-speak dished out over the traditional media. If you want to know what the candidates really have to say (if they have anything to say), as well as to engage in some serious political discourse with fellow voters, turn off the TV, put down the paper, and hang up on the poll taker–and check out ElectionLine on the World Wide Web.

A joint venture of Digital, the *Washington Post*, ABC News and *Newsweek*, the ElectionLine Web site should prove to be this year's hot spot for pundits, politicos, and public alike. ElectionLine covers daily campaign events, provides information on candidates and issues, offers commentary and analysis, and delivers real-time coverage of election results. There also will be interactive forums, for the public to discuss issues and provide views. Digital is providing the hardware with its 64-bit Alpha, along with the Web forum software. Digital partners Personal Library Software, Inc. provided the search engine and Persimmon IT helped design the site for easy navigation.

Of course, the rest of the world does still turn outside of the political arena. So, just jump over to one of the Knight-Ridder newspapers now on the Web. They're using SGI's WebFORCE CHALLENGE servers to put up as many as 31 sites. With seven online already, and new ones coming on at a rate of two a month, they may make it by the end of the year. Content for the Web papers is created and edited on a WebFORCE Indy workstation, which acts as both an authoring station and a staging file server. Pages are updated several times a day and then sent to a public Web server in Virginia. Knight-Ridder says it eventually will add video, audio, and animation to the sites. We may never look at a newspaper the same way again.

When we're not all clustered around our Web browsers, we may be clustered back at the office. A number of vendors made cluster announcements in late winter. HP came out with enhancements to its high-availability offerings for HP 9000 customers. The company introduced management software that integrates clusters into the OpenView framework, complete with a visual map and event-triggered color coding. The new software integrates clusters from anywhere in a distributed network into a single management station, which certainly makes life easier for monitoring and controlling large clustered networks. HP also announced its High Availability Storage System, which accommodates 2-GB and 4-GB disks, as well as DDS-2 tape drives, and features hot-pluggable storage and support for dual SCSI-2 buses for disk-mirroring within the enclosure.

Data General unveiled its four-system AViiON cluster at UniForum. The clusters give the company's DG/UX customers a high-availability option along with a graphical management interface. The company says its DG/UX Clusters can be interconnected across multiple sites with replication server software to accommodate enterprisewide availability requirements.

Digital announced a new adapter that allows PCI-based AlphaServers to hook up with the CI-based storage subsystems used in OpenVMS clusters. Part of Digital's StorageWORKS offering, the

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company says the adapter provides ready access to both high-performance storage controllers and industry-standard SCSI devices. The idea is to open up the door to more storage expansion options, RAID, and high-performance backup solutions. PCI is certainly the fast way to do it.

Finally, SGI came out with a fail-over solution for its CHALLENGE servers and claims it can deliver 99.9 percent uptime. Called IRIS FailSafe, SGI says the software will support two clustering configurations–either two active servers with separate file systems or one active server that fails over to a hot standby.

The CHALLENGE cluster uses shared storage either on RAID subsystems or mirrored disks. The software also has a scripting feature, which the company says can be used to restart applications. SGI is offering restart kits for NFS and Netscape Web services, too. ◧

James H. Gamble is a freelance writer and communications consultant for technology-based products and services companies. He can be reached by phone at (603) 673-1904 or by e-mail at jhg@mv.mv.com.

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CIRCLE 56 ON READER SERVICE CARD

New Products

Windows Translator

QualSoft and Non Standard Logics (NSL) have announced XFaceMaker/Win, a new addition to the XFaceMaker line of X/Motif GUI builders for the rapid deployment of applications in the UNIX and Windows environments.

XFaceMaker/Win enables users to translate a Motif GUI into an MS Windows equivalent version with a click of the mouse. The generated code can then be compiled on a Windows platform and from there be ported to a Macintosh.

Fully functional Motif GUIs can be developed and translated into Windows Visual C++ code using Microsoft Foundation Classes, as well as additional classes provided by NSL to implement Motif functionality missing in Windows. XFaceMaker/Win also allows the translation of Motif GUIs generated by other GUI builders.

XFaceMaker/Win is priced at $1,995 for a single-user network license in North America, and at 15,000 FF in Europe. The XWin-Pack, which includes XFaceMaker/IL or UIMS and the XFaceMaker/Win translator, is priced from $3,750 in North America and from 39,000 FF in Europe. Quantity discounts are available.

Contact QualSoft (North American distributor), phone: (415) 494-6100, fax: (415) 494-6099, e-mail: info@qsoft.com, or contact NSL in Paris, France, phone: (33)1 44 08 70 80, fax: (33)1 44 08 70 81, e-mail: info@nsl.fr.

Scanning Software

tummy.com, ltd. has announced XVScan Version 1.21, which adds batch command-line image and document scanning capability to the interactive X11 scanning and image manipulation program XVScan.

XVScan works under HP-UX 9.x and 10.x with HP ScanJet scanners. It is based on xv, image manipulation software for X Windows, and handles 24-bit color, 8-bit grayscale, and 1-bit monochrome images. Supported image formats include GIF, JPEG, TIFF (compressed and uncompressed), PostScript (requires ghostscript), PBM/PGM/PPM (raw and ASCII), X11 Bitmap, and XPM (X PixMap).

The new command-line scanning utility "sjscan" allows full control of the scanner and Auto Document Feeder to provide unattended batch scanning of up to 50 pages. Updates to the ScanJet API allow other applications to control an HP ScanJet scanner.

XVScan is priced at $50 for ftp or e-mail delivery. It is also available on 3.5-inch floppies or 4-mm DAT tape for an additional $15 in the United States or $25 internationally.

Contact tummy.com, ltd, phone: (402) 344-4426, fax: (402) 341-7119, URL: http://www.tummy.com/xvscan/hpux, email: xvscan@tummy.com

Text Editor

Inclination Software, Inc. has announced the Quick-E text editor, which runs under Microsoft Windows but edits files on UNIX and other host systems. The Quick-E package is designed for simple editing tasks and provides rapid response and a true and up-to-date Windows interface for editing UNIX files.

Host files are selected from familiar Windows dialogues, which allow the user to browse through files and traverse host directories before selecting the file. The interface uses the familiar Windows Multi Document Interface, which allows multiple overlapped, resizable, stackable windows. Standard Windows cut-and-paste and search-and-replace

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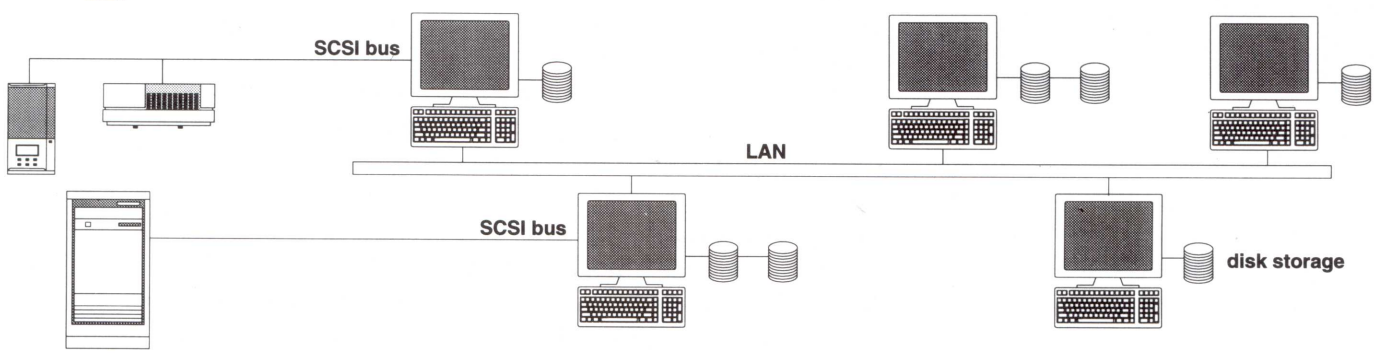

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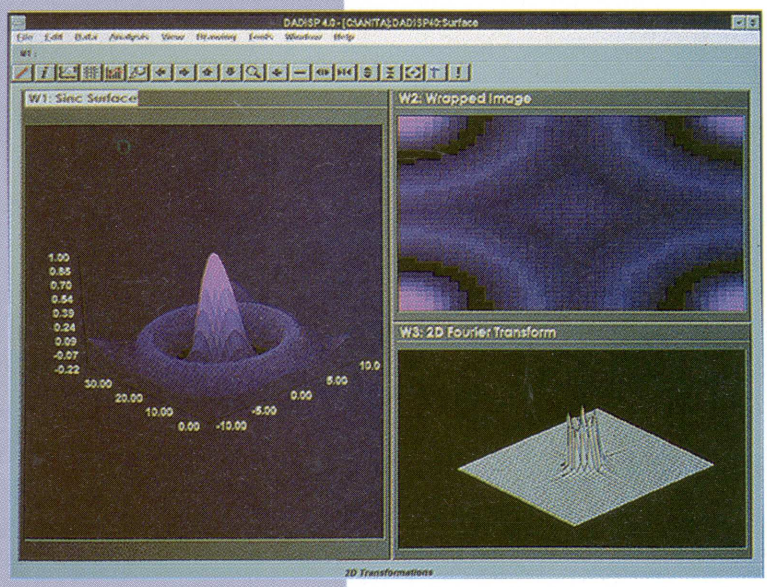
CIRCLE 157 ON READER SERVICE CARD

Graphical Data Analysis

DSP Development Corporation has announced DADiSP 4.0, a major new release of its graphical data analysis software package. The new release extends the capabilities of DADiSP to collect, analyze, and display scientific and technical data in a format that is intuitively understood by scientists and engineers.



DSP Development DADiSP 4.0

Native MS Windows and OSF Motif GUI standards have been incorporated, using common dialogue boxes for standard cross-application operations. DADiSP 4.0 offers Dynamic Data Exchange (DDE) in MS Windows. DDE is an inter-program communications protocol that allows disparate applications to easily exchange data.

DADiSP 4.0 also includes a complete programming language called Series Processing Language, or SPL, which is modeled on the C language. It offers online documentation and improved printing capabilities, with added plot titles, legends, multiple scales, selectable fonts, and a preview mode. Postscript, HPGL, Metafile, and native bitmap formats are supported.

DADiSP 4.0 is priced at $1,895 for PCs and $2,995 for workstations.

Contact DSP Development Corporation, phone: (800) 424-3131 or (617) 577-1133.

operations are supported, as well.

Quick-E can work with virtually any host computer that supports the FTP protocol.

Quick-E is priced at $49. Demonstration versions can be downloaded off the Internet by contacting the Inclination Software Web page at *www.isiinc.com* or by calling the company.

Contact Inclination Software, Inc., phone: (702) 831-5595, fax: (702)831-4979.

New from Prentice Hall PTR

SunSoft Press Java Series

Prentice Hall PTR and SunSoft Press have announced a series of books devoted to Java, The Sun Soft Press Java Series. The first titles in the series were scheduled to be published in March 1996.

Java is Sun Microsystems' object-oriented platform-independent programming language. It provides technology that empowers developers to make full use of multimedia and interactivity, most notably on the World Wide Web, where once-static images are being transformed with such special effects as animation and sound.

This series of original authored works on Java will deliver key information about this technology to programmers, application developers, and others interested in using Java. The first titles to be published in the series are: *Instant Java* by John A. Pew, *Java by Example* by Jerry R. Jackson and Alan L. McClellan, *Just Java* by Peter van der Linden, and *Core Java* by Gary Cornell and Cay S. Horstmann.

Web Surfing Guide

Prentice Hall and Hewlett-Packard Professional Books have announced *The Essential Web Surfer Survival Guide* by Jenny Fristrup, a PC user's guide to making the most of the Web.

The Essential Web Surfer Survival Guide helps PC users get up and running quickly and easily on the WWW. The book is an easy-to-read, nontechnical guide to the WWW along with all the products and tools associated with the WWW, such as Mosaic and Netscape. The book features a friendly introduction to WWW, instructions on how to find what you want on the Web, and NetCruiser Internet software, a Web browser/Internet access tool. The book also covers hypertext and HTML, how to create your own home page, putting information on the Web, Internet tools, how to navigate within the Web using URLs, a directory of URLs, and using the Web to learn more about the Web.

The Essential Web Surfer Survival Guide (ISBN: 0-13-442971-0), by J. Fristrup is $24.95.

Internet Beginner's Guide

Prentice Hall PTR has announced *Zen and the Art of the Internet: A Beginner's Guide*, Fourth Edition, by Brendan Kehoe. This is the latest edition of the critically acclaimed, best-selling

Interex Online http://www.interex.org

beginner's guide to the Internet.

Using his unique, easy-to-read, light, and entertaining style, Kehoe guides Internet and WWW users to the wonders of the information superhighway. Kehoe has fully updated the fourth edition, added new information about the WWW, and added a special section devoted to "Kids and the Net."

The book assumes no knowledge of the Net and helps users get up to speed quickly and easily. A Net insider, Kehoe even includes amusing facts and stories to illustrate the culture of the Net. *Zen* is for anyone, no matter what type of operating system is being used.

Zen and the Art of the Internet: A Beginner's Guide, Fourth Edition (ISBN: 0-13-452914-6), by B. Kehoe is priced at $23.95.

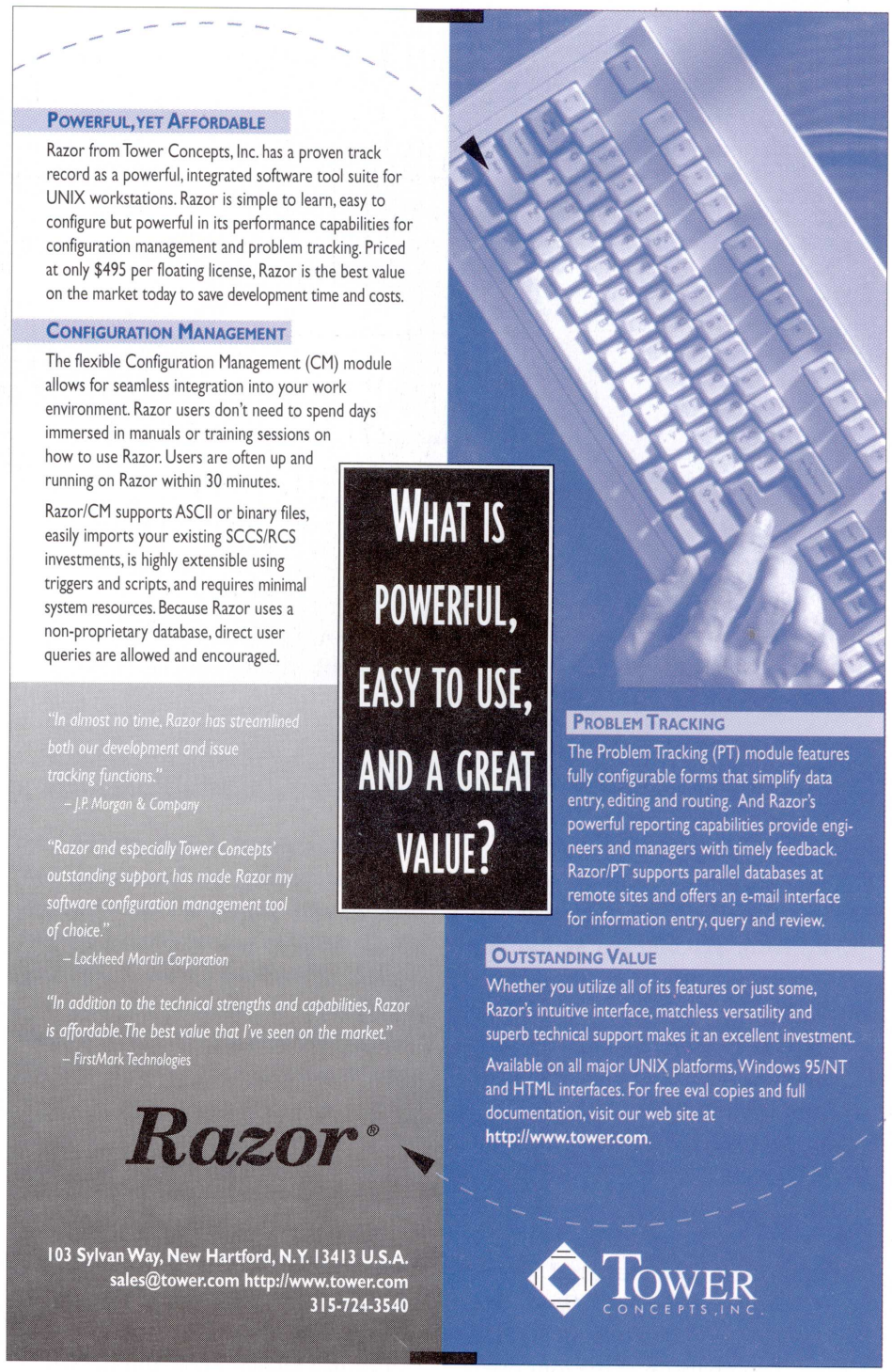
Contact Prentice Hall PTR, phone: (800) 947-7700 or (515) 284-6751, fax: (515) 284-2607, e-mail: orders@prenhall.com.

SCSI Gateway

Computer Network Technology Corporation (CNT) has announced enhancements to its SCSI Gateway, as well as a new SCSI Multiplexer. CNT's SCSI Gateway transparently interconnects standard System/390 channels (including ESCON) with the industry-standard SCSI bus. Newly added to the product is a fast/wide bus interface, bus extension, and ESCON support to further add to the product's storage networking capabilities.

CNT's new SCSI Multiplexer offers high-performance, many-to-any connectivity between multiple servers and devices using the standard SCSI bus. Up to six servers can transparently access devices on the same SCSI bus.

SCSI Gateway enhancements are priced as follows: the SCSI fast/wide



CIRCLE 42 ON READER SERVICE CARD

FDDI Probe

Armon Networking, Inc. has announced the incorporation of FDDI support into its OnSite line of RMON-based products. RMON support for the new FDDI OnSite Manager additions is based on RFCs 1757 and 1513. Applications are provided for all nine RMON groups specified by RFC 1757. These products are RMON II ready with Armon MIB extensions for Protocol Distribution and Level-3 (network-layer) Matrix, allowing network managers to see fiber backbone traffic with OnSite EyeNet internetworking monitoring and OnSite NetReporter.

Armon OnSite

The hardware is based on the Intel i960 RISC processor (33 MHz), with a dedicated controller for enhanced performance. The probes include up to 28 MB of DRAM and 1.5 MB of FLASH for downloadable software stored in compressed format.

The FDDI probes come standard with bypass switch control. Single Attach Station (SAS) configurations start at $9,500, and Dual Attach Stations (DAS) start at $11,000.

Contact Armon Networking, phone: (805) 965-0859, fax: (805) 965-5689, e-mail: armon@armon.com.

interface is priced at $11,000, the ESCON device interface is priced at $18,000, and the SCSI bus extension is priced from $20,000 per system for unlimited distance, SCSI-2 fast/wide extension over a T1 interface. (Wide area interfaces over T3 and frame relay are also available.) The SCSI Multiplexer is priced from $5,000 to $12,500.

Contact CNT, phone: (617) 498-2300, fax: (617) 498-2480, http://www.cnt.com.

Operating System Guide

Digital Press has announced *Software Implementation Techniques: Open VMS, UNIX, OS/2, and Windows NT* by Don Merusi, a comparison of the four operating system platforms mentioned in the title. The book provides an introduction of how to migrate comparable program functionality between the different platforms. By comparing four operating systems in one book, it eliminates the need for several manuals. The topics covered include process and thread scheduling, synchronization and concurrency primitives, file management, memory management, performance, networking facilities, and user interfaces.

Don Merusi has been a senior computer systems support specialist for 22 years. He is also an associate adjunct professor at the Hartford Graduate Center and teaches courses on operating systems.

Software Implementation Techniques: Open VMS, UNIX, OS/2, and Windows NT (1-55558-134-X) by D. Merusi is priced at $49.95.

Contact Digital Press, phone: (617) 928-2500, fax: (617) 928-2620.

Enterprise Calendar/Scheduling

Enterprise Solutions Limited (ESL) has announced an enterprise-wide, e-mail-enabled calendar solution with multiple client platform support. EXM/Time is designed for use with X.400-based EXM Mail. It provides seamless scheduling, with automatic time zone adjustment, as well as resource management, personal calendar and information management, and task management.

EXM/Time is the result of an OEM agreement between ESL and Corporate Software & Technologies Int., Inc. (CS&T). EXM/Time is CorporateTime, CS&T's calendar/scheduling solution, which has been X.400 mail-enabled with ESL's EXM Mail. EXM Mail is available across all popular platforms. EXM/Time runs on various UNIX platforms and provides uniform cross-platform support for Windows, Macintosh, UNIX character, and Motif clients.

EXM/Time, an add-on module, is priced from $40 to $120 per user depending on quantity.

Contact Enterprise Solutions Limited, phone: (805) 449-4181, fax: (805) 449-4186.

Help System Development

ObjectSpace, Inc. has added HelpDesigner, the integrated help development tool for VisualWorks and ENVY, to its Smalltalk product line. HelpDesigner, which is rich in features and provides flexible choices in authoring tools, is a GUI toolbox that allows a non-developer to design and add help to any Smalltalk application.

ObjectSpace entered an exclusive distribution agreement with GreenPoint, Inc., the creator of the program. Under the agreement, ObjectSpace will be the sole distributor of HelpDesigner.

HelpDesigner is provided with source code and can be used on any platform supported by ParcPlace VisualWorks or VisualWorks/ENVY. The help files generated by HelpDesigner are platform-independent. A developer's license for HelpDesigner costs $950 plus support.

HelpDesigner offers keyword searches and true embedded images, and it includes a comprehensive tool for installing and uninstalling images and managing help files and classes. HelpDesigner's unintrusive design affects few base classes. It also supports RTF.

Contact ObjectSpace, Inc., phone: (214) 934-2496, e-mail: info@objectspace.com, http://www.objectspace.com.

Data Warehousing

PLATINUM technology, inc., has announced the following upgraded data warehousing products: PLATINUM Data Shopper 1.2, PLATINUM Repository/MVS 3.3, PLATINUM InfoPump 2.0, PLATINUM InfoHub 2.0, PLATINUM InfoTransport 3.0, and PLATINUM InfoRefiner.

PLATINUM Data Shopper, which provides easy access to information in the data warehouse repository via an MS Windows interface, now includes support for external query tools and new querying capabilities.

PLATINUM Repository/MVS 3.3 includes support for new import sources (such as Informix, LBMS, and PLATINUM InfoRefiner) and management capability enhancements.

InfoPump, which offers data replication and routing, has been optimized to support full 32-bit implementations of HP-UX, Sun Solaris, and AIX, and the Microsoft Windows NT operating system. It also features a series of new database interfaces.

Continued on Page 84

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Concorde Technologies Model 452 DLT

Digital Linear Tape Library

Concorde Technologies, Inc. has announced a strategic partnership with Hewlett-Packard as a supplier of Digital Linear Tape (DLT) Libraries for the HP 9000 business servers. Under the arrangement, HP will recommend and support Concorde's DLT-based Model 452 as the preferred automated tape solution for customers buying its business server products. All library sales, service, installation, and support will be handled through Concorde and contracted service organizations.

The Model 452 features four DLT drives and fifty-two 20-GB cartridges for an available capacity of more than 1 terabyte. With data compression enabled, capacity is boosted to well over 2 terabytes. Each of the four DLT drives supports a sustained data rate of 1.5 MB per second in native mode, at least three times as fast as 4-mm DAT drives.

The Model 452 has been certified on the HP 9000 Business Servers running HP OpenView OmniBack II under HP-UX 9.04 or HP-UX 10.0.

Contact Concorde Technologies, phone: (619) 536-5000, fax: (619) 566-4396.

InfoTransport Version 2.0 now supports change propagation from InfoRefiner, enabling companies to distribute just the changes to a data file. It also includes GUI enhancements and support for DB2 for MVS Version 4.0 as a source and Informix as a target.

InfoRefiner Version 3.0 enables more efficient management data extraction, refinement, and movement from mainframe sources into a data warehouse.

PLATINUM InfoHub 2.0 allows access to data stored in nonrelational legacy database management systems using the same SQL commands used to access RDBMSs.

Contact PLATINUM, phone: (708) 620-5000, fax: (708) 691-0710, e-mail: info@platinum.com.

Storage System

Zitel Corporation has announced its new SCP-II (Storage Co-Processor) system, an extremely high-performance storage architecture designed for use with RDBMSs and OLTP applications on UNIX, Windows NT, OpenVMS, or NetWare platforms. SCP-II delivers significantly faster data access than traditional disk or RAID technologies, providing up to 600-percent improvement in database performance, the company notes.

SCP-II uses a patented "intelligence-based" caching system and multiprocessor architecture to deliver I/O performance that rivals that of solid-state disks, but at a fraction of the cost.

The SCP-II system is designed for modular, cost-effective scalability and fault-tolerant data protection. SCP-II modules can be combined in standard rackmount data cabinets or pedestals. Each SCP-II module has a formatted capacity of 4.3 GB to 17.2 GB, and up to six modules can be configured in a single cabinet for over 103 GB of storage.

SCP-II units are available for HP 9000 Series 700 and 800 servers and other platforms. Entry-level SCP-II storage modules with 17.2 GB of disk storage and 64 MB of cache per module are priced at $37,995.

Contact Zitel Corporation, phone: (510) 440-9600 or (800) 622-5020, fax: (510) 440-9666.

Software Support Services

Quest International, Inc. has announced a comprehensive multiplatform support program for UNIX and distributed systems. Drawing on its expertise and knowledge of corporate computing and engineering, Quest's new software support service allows companies to call on one source for all their support needs.

Quest's highly qualified senior technical staff handles all support calls. Operating systems currently supported include Sun OS, Solaris, HP-UX, SGI IRIX, OS/2, MS-DOS, Windows NT, Windows 95, and Novell.

The support program provides technical expertise in the areas of answer line, onsite/remote systems administration, Webmaster services, and network support. Consulting services are provided for network and systems security, optimization, and analysis; firewall establishment; and platform migration studies.

Contact Quest, phone: (800) 231-6777, e-mail: info@questinc.com, http://www.questinc.com.

CGI Program

Cuadra Associates has announced STAR/Web, an option to the company's powerful STAR information management and retrieval software. STAR/Web is a common gateway interface (cgi-bin) program

Interex Online http://www.interex.org

that connects STAR software to any standard or commercial World Wide Web server (http daemon). With STAR/Web, data administrators can let users of their Web hosts or hosts on their in-house networks use common Web browsers—such as Mosaic or Netscape Navigator—to search for information organized and structured into online databases.

STAR/Web offers database administrators a simple way to enable complex searches by users who may know little or nothing about the structure and content of the data.

STAR/Web pricing depends on the number of simultaneous users supported and typically adds about $240 per simultaneous user to the system price. STAR/Web requires the STAR UNIX-based software for managing, accessing, and presenting all types of information from corporate and other institutional databases.

Contact Cuadra, phone: (310) 478-0066 or (800) 366-1390, e-mail: hq@cuadra.com.

Four-bay Rackmount Enclosure

Artecon has released a -48VDC version of its new Sphinx 4000 four-bay rackmount enclosure. Sphinx 4000 - 48VDC enclosure supports the use of off-the-shelf SPARC 5 and 20 workstations/servers and the HP 9000 Model 712 workstation and any combination of up to four removable 5.25-inch half-height devices and 3.5-inch hot-plug removable disks, or two removable full-height 5.25-inch devices. It occupies 7 inches of vertical rack space.

The Sphinx 4000 48-volt adds a removable power supply and removable trays, and single or dual SCSI I/O connections for all devices.

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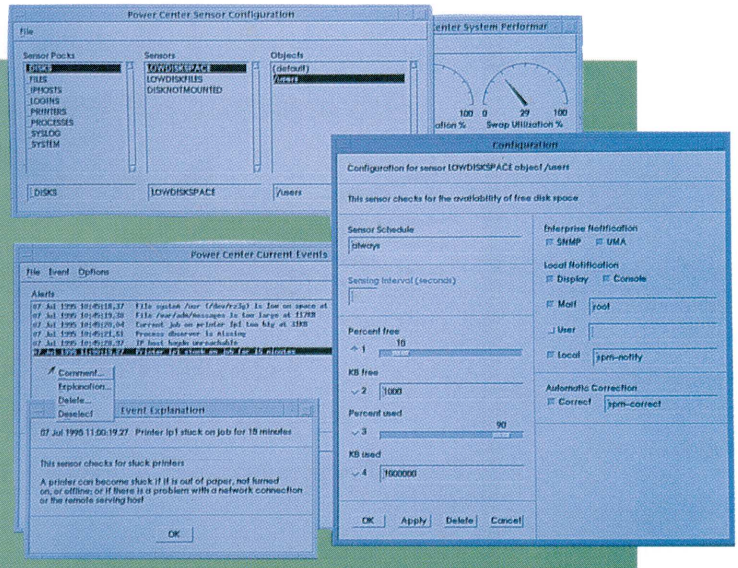
Power Center Software



Enterprise Management

Power Center Software has enhanced its Power Center management suite to support HP-UX. Power Center guarantees system availability and improves management efficiency by rapidly detecting and correcting problems with computer systems, networks, peripherals, and applications. It is designed to simplify management of single workgroup systems to worldwide networks of thousands of systems.

Power Center brings fault-free, multivendor management to client-server and legacy systems by using important industry standards. It interoperates with leading management applications including OpenView, NetView, and SunNet Manager.

Power Center automates the task of problem detection, containment, investigation, and resolution, and it automatically corrects system problems wherever they occur, according to each company's individual "lights-out" policy.

Prices start at $495 per node, depending upon machine size.

Contact Power Center Software LLC, phone: (303) 220-1500, fax: (303) 220-9776.

applies power to all encapsulated devices, including the workstations.

All models list for $4,795. Delivery is immediate.

Contact Artecon, phone: (619) 931-5500.

Graphical Editor

MicroEdge, Inc. has announced Visual SlickEdit for X Windows on several UNIX platforms, including HP-UX. Programmers migrating from Visual SlickEdit on other operating systems will find that their editor customizations, including macros, are compatible across all Windows-based, OS/2, and X Windows platforms. Visual SlickEdit has support for popular version control systems on all Windows platforms, OS/2, and X Windows systems, including SCCS and RCS. It also supports syntax expansion, tagging, and color-coding for more than a dozen languages, including Java and HP SoftBench 4.0 and 5.0. Programmers can define custom support for their own version control system, as well. Brief, Emacs, vi, and CUA emulations are included with Visual SlickEdit on all platforms.

Visual SlickEdit sells for $395 for all X Windows platforms except for Linux. Visual SlickEdit for Linux sells for $195 per user. Visual SlickEdit for Windows-based platforms sells for $295 per user. Visual SlickEdit for OS/2 sells for $219 per user.

Contact MicroEdge, Inc., phone: (800) 934-EDIT or (919) 831-0600, fax: (919) 831-0101.

Storage Management

Software Partners/32, Inc. has announced StorageCenter, a storage management suite for UNIX. It offers four tightly integrated applications: Backup and Restore, Media Management, Archiving, and Administration.

StorageCenter is offered in Enterprise, Workgroup, and Personal versions. The Enterprise version is aimed at large data centers supporting client-server networks. It can manage a virtually unlimited number of CPUs and storage devices as a single "storage domain" and offers multisite parallel backups, save set copying for offsite vaulting, and automated media cycling.

The Workgroup version is designed for departmental networks and offers increased reliability and ease of use. A GUI eliminates the need to create and edit complicated backup scripts, and tape labeling prevents accidental overwriting of an unexpired backup volume.

The StorageCenter Enterprise version is priced starting at $6,250. The Workgroup version is priced starting at $1,875. The Personal version will be priced upon release later this year. StorageCenter supports HP-UX and other platforms.

Contact Software Partners/32, phone: (508) 887-6409, fax: (508) 887-3680, e-mail: info@softwarepartners.com.

Web Products

TriTeal Corporation and Spyglass Inc. have announced a licensing agreement in which TriTeal will adopt Spyglass' server technology as the basis for TEDserver, TriTeal's enterprise server product. The TEDserver Early Release, priced at $199, includes one year of technical support.

TriTeal has already integrated Spyglass' client technology into the TriTeal Enterprise Desktop (TED), reportedly the only X/Open-branded, multiplatform implementation of the CDE specification.

TriTeal also announced a fully integrated, comprehensive client-server Web solution that includes an integrated browser, personal Web server, enterprise server, Web-aware applications, and data-level security. The personal Web server and associated management tools will be integrated and bundled with TED 4.1, scheduled for release in mid 1996. TriTeal's enterprise Web server, TEDserver, will include a variety of enhancements to the Spyglass server code. TEDserver and TriTeal's personal server will also include data-level security capabilities in future releases.

Contact TriTeal, phone: (619) 930-2077, fax: (619) 930-2081, e-mail: info@triteal.com.

Workstation Memory

Kingston Technology has announced price decreases on its workstation memory line for all Sun Microsystems, Hewlett-Packard, Silicon Graphics, IBM RS6000, and Digital Equipment Corporation workstations. Kingston's 64-MB module for HP 9000 Model 750 workstations retails for $3,395, while HP's equivalent module retails for $4,160.

All Kingston memory is backed by a lifetime warranty with a 24-hour product replacement policy. All memory is 100-percent tested and guaranteed fully compatible with the system, diagnostics, and software for which it is designed.

Kingston markets its products through a worldwide network of distributors, major reseller chains, and

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Java Development Environment

TakeFive Software has announced the release of SNiFF+ 2.2, an integrated software development environment that fully complies with the Java language specification. SNiFF+'s integrated toolset provides tools for browsing, editing, compiling, and debugging Java applications.

SNiFF+ open architecture provides multilanguage development support for Java and C/C++. The product ships with a Java parser, seven browsers, including an inheritance browser, source code management tools, a documentation editor, and the Java Developer Kit (Java class library, compiler, debugger, etc.). The documentation editor supports the generation and maintenance of source-level documents in HTML format.

Contact TakeFive, phone: (408) 777-1440, fax: (408) 777-1444, e-mail: info@takefive.com, http://www.takefive.com.

New from Dimension Software

CONTROL-M 2.2.0

New Dimension Software, formerly 4th Dimension Software, has announced Version 2.2.0 of its CONTROL-M enterprise production scheduling and control solution, featuring expanded product scalability.

CONTROL-M allows operations personnel to easily manage and automate the setup, scheduling, and execution of processes running across multiplatform client-server environments. New agent technology allows users to implement CONTROL-M servers and agents in different combinations to maximize the availability of their computing environment while streamlining the management of these systems.

CONTROL-M 2.2.0 is designed to manage the production activities for both mainframe and nonmainframe platforms and consolidate their respective schedules.

Prices start at $20,995 for a base configuration including the Enterprise Controlstation component.

Security Administration

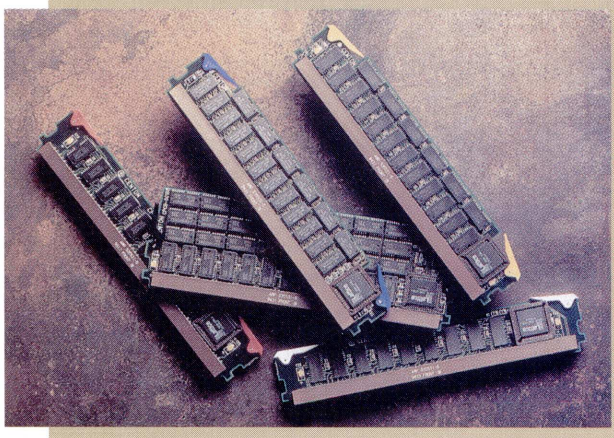
New Dimension Software also announced MultiPlatform CONTROL-SA for enterprise-wide security administration. Enterprise SecurityStation and SA agents provide a central point of management for various commercially available security systems. By providing a common interface for individual products spanning multiple platforms and operating systems, MultiPlatform CONTROL-SA allows administrators to easily implement uniform procedures for the existing security systems in heterogeneous environments.

The Enterprise SecurityStation GUI provides the administrator with a central point of control for overseeing functions such as user management, which defines uniform security procedures across all platforms. The Enterprise

Memory Upgrades

Centon Electronics Inc. has announced new memory upgrade kits, the Centon Sun Ultra Series and the Centon HP 9000 Series. These products are designed for use in Sun and HP high-performance workstations and for applications such as 3D modeling, simulation, CAD/CAE, and financial modeling. For the latest HP workstations, Centon is among only a few companies to offer a 256-MB upgrade kit.

Centon's HP 9000 Series supports HP 9000 Models 720, 730, 735/99, 735/125, 750, and 755. Memory upgrade kits include a pair of matched memory modules in five different densities. Due to memory interleaving used in the HP 9000 series, modules must be installed in sets. The new offerings provide an additional 16, 32, 64, 128, and 256 MB. HP 9000 Models 720 and 730 can be brought up to 256 MB, the Model 735 can be brought up to 400 MB, the Model 750 can be brought up to 384 MB, and the Model 755 can be brought up to 768 MB.



Centon Electronics, Inc.

Pricing of HP 9000 memory ranges from $750 to $9,990.

Contact Centon, phone: (800) 234-9292 or (714) 855-9111, fax: (714) 855-6035, e-mail: ussales@centon.com.

Interex Online http://www.interex.org

SecurityStation maintains an audit trail of events based on prioritized alerts.

New Dimension Software's Enterprise SecurityStation is a UNIX-based application that runs on Sun, HP, or IBM workstations. SA agents are available for HP-UX and other platforms.

Contact New Dimension Software, phone: (800) 347-4694, ext. 522, or Memco Software, at (800) 862-2602; outside of North America, phone Tel Aviv: 972-3-645-1111; http://www.ddddf.com.

New from Black & White Software

Installation and Integration Tool

Black & White Software has announced Integration Manager 2.0, designed to automate the installation and integration of various application development products, including the UIM/X GUI development tool from Visual Edge Software, View.h++ class bindings for OSF/Motif from Rogue Wave Software, XRT widgets from KL Group, Orbix object request broker from IONA Technologies, and Xmove dynamic graphics package from Siemens Austria PSSE.

The Integration Manager 2.0 includes enhancements over the previous version, including a new icon-driven user interface, automatic package installation from CD-ROM or other media, and integration support for additional packages.

The Integration Manager automates the tasks required for integrating tools with UIM/X that formerly had to be performed manually. A customized application development environment can be rapidly built, tested, and installed.

Integration Manager 2.0 is available now for HP-UX and other UNIX platforms. Pricing is $250 per single user or

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Real-Time Distributed Software

VERILOG has announced ObjectGEODE, an object-oriented tool for software development teams working on real-time, distributed applications for client-server networks. The package provides support throughout the development cycle, particularly in design analysis, verification/validation, simulation, C++ programming, and test generation.

The tool manages real-time application constraints including time factors, event processing, parallelism, and distribution. Advanced object-oriented design and analysis technology is used to implement client-server architectures, increase reuse of code at all stages of development, and ensure that generated applications are open-ended. Complementary object-oriented approaches based on standards are readily integrated.

The package operates on a range of workstations, including HP 9000 Series 700s.

Contact VERILOG, phone: (214) 241-6595, fax: (214) 241-6594.

$1,000 per network site per platform.

Distributed Database Applications

Black & White Software also announced DB/Enable, which extends the power of the UIM/Orbix distributed graphical application builder and Orbix object request broker to leading databases, such as Sybase and Oracle.

Orbix from IONA Technologies is an implementation of the Object Management Group's CORBA (Common Object Request Broker Architecture) specification. DB/Enable was developed to facilitate the construction and deployment of both graphical and non-graphical database client programs. Transparent client-server distribution is achieved through Orbix. As a result, relational database clients can work with other CORBA-based applications using a single, industry-standard distribution mechanism.

Pricing for a development seat is $1,500 for a single connection license and $3,000 for a multiple-connection license. Additional database access libraries can be attached for $1,000 each.

Contact Black & White Software, phone: (408) 369-7400, fax: (408) 369-7406, e-mail: info@blackwhite.com, http://www.blackwhite.com.

New from HP

Web Browser Interface

HP has introduced an HP OpenView integrated system- and network-performance management solution, for isolating network-performance components and identifying problems in a client-server environment. The company also announced the HP NetMetrix Web Reporter, which pinpoints network hot spots and distributes performance information via the World Wide Web.

Using the two new enhanced HP NetMetrix applications, HP's Internetwork Response Manager and Internetwork Response Agent, IT managers can narrow the scope of analysis and expose weak components by isolating problem conditions and providing simultaneous analysis of multiple client-server pairs.

When combined with HP's PerfView analyzer and MeasureWare Agent software, these applications can help users identify system, network, application, and database components. HP NetMetrix applications provide network-response-time management information, while metrics from MeasureWare, such as Transaction Tracker, allow IT managers to measure end-to-end response time of business-application transactions.

HP NetMetrix Web Reporter functions as a service tool for troubleshooting network problems, as a means of monitoring daily operation to determine how best to optimize the network, and as a planning tool to manage network growth and determine return-on-investment projections. It automatically collects data from standard remote monitoring agents, provides high-level analysis, and generates reports, which it can display on any kind of personal computer.

HP NetMetrix/UX Internetwork Response Manager is priced at $3,995. HP NetMetrix/UX Internetwork Response Agent is priced at $495. HP NetMetrix/UX Web Reporter is priced at $4,995. HP PerfView Analyzer costs $8,000, and HP MeasureWare Agent costs $2,000.

HP OpenView IT/Administration

HP also announced HP OpenView IT/Administration, a combined management solution for system administrators. HP combined HP OpenView AdminCenter, a key component of the HP OpenView Solution Framework, with HP OpenView Network Node Manager, to make the solution easy to order and deploy. In addition, the combined product offers expanded database and platform support as well as improved self-management and security capabilities.

IT/Administration will include support for Oracle databases; it currently supports CA-Ingres and Open Ingres. Additionally, IT/Administration has been integrated with IT/Operations. Because IT/Operations' intelligent agents provide real-time monitoring, OpenView operators can be notified immediately of undesired changes to the managed environment.

IT/Administration, expected to be

available in June, starts at $26,000. The IT/Administration upgrade kit for customers currently holding licenses for HP OpenView Network Node Manager starts at $17,000.

Information about HP and its products can be found on the Web at *http://www.hp.com.*

Attention vendors: New product announcements should be sent to New Products Editor, hp-ux/usr *magazine, Interex, P.O. Box 3439, Sunnyvale, California 94088-3439, USA.*

Deadline for submission is two months prior to publication.

New Products refers to numerous products by their trade names. In most cases, these designations are claimed as trademarks or registered trademarks by their companies.

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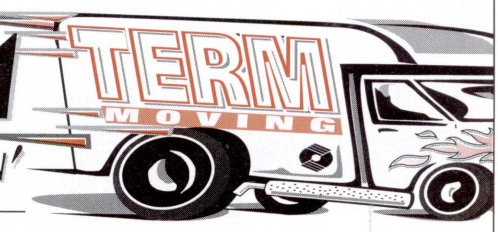

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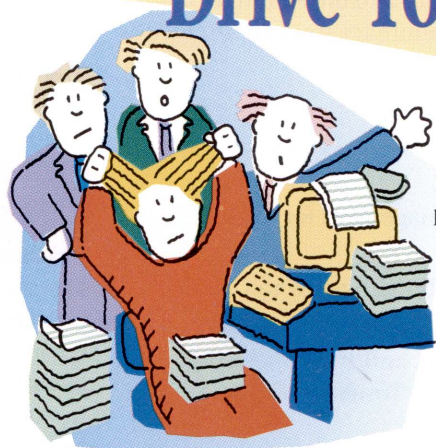

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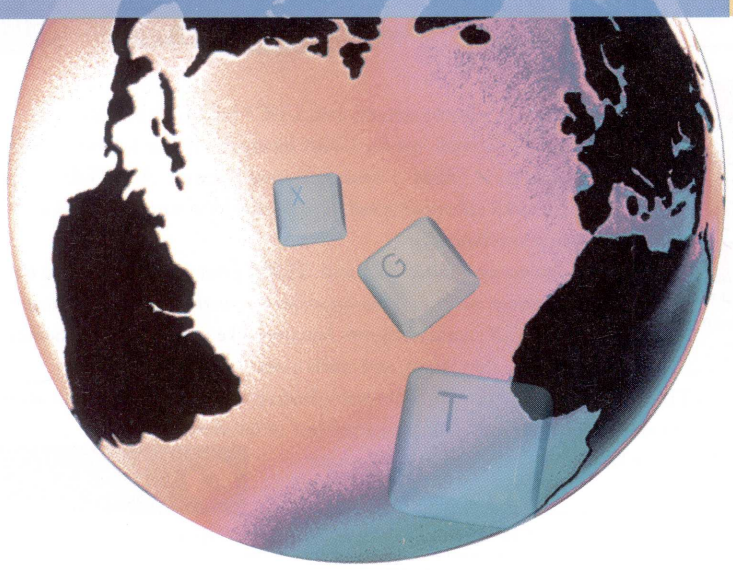
Training Seminars



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For computing professionals utilizing HP 9000 technology, here's an in-depth look at a ***few*** *of the seminars most applicable to your environment.*

HP WORLD '96

August 4 – 9, 1996
Anaheim, California
Anaheim Convention Center

Packed with the real-world experience you need to get up to speed on many of today's most critical issues, HP WORLD '96 training seminars are some of the most valuable seminars of the year. Here's a list of the seminars you can attend Monday, August 5, 1996:

- Building a Web Site
- Using Information Technology for a Competitive Advantage
- Network and System Management for HP-UX 10.0
- Distributed Computing Technologies and Products
- Positioning, Configuring, and Interoperating in a Heterogeneous UNIX/Windows NT Environment
- HP-UX and Internet Security
- Data Warehousing
- Second-Generation Client-Server Technology
- Introduction to Visual Basic
- Creating Market-Focused Products
- Enabling Technologies for Supply Chain Management

Network and System Management for HP-UX 10.0

Many new tools and features that have been introduced with HP-UX 10.x make managing the system easier and provide added flexibility for the system and network administrator.

Who should attend:

System Analysts, System Administrators, Network Administrators, and Information Systems Supervisors who are implementing or planning systems using HP-UX 10.x will benefit from this program. Familiarity and experience with HP-UX 9.0 and 10.0 basic features is assumed.

After completing this class, you will be able to:

- Identify ways to utilize the new HP-UX 10.x features
- Develop strategies and tactics for implementing 10.x environments

Positioning, Configuring, and Interoperating in a Heterogeneous UNIX/Windows NT Environment

More and more organizations must now implement and configure networking services in a heterogeneous environment of UNIX servers, Windows NT servers and clients, NetWare clients, and Windows clients. Knowing how to set up consistent and manageable interoperability in this kind of environment is challenging, but necessary to achieve a successful enterprise environment. This seminar offers practical insights into interoperability issues such as file and print services, security, and system backup and recovery in a multivendor enterprise.

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ıds-on information in order to implement new ıting environment? Then HP WORLD '96 training you.

Who should attend:

System Administrators/Integrators and IT Technical Staff/Consultants who need a practical approach to achieving systems integration in mixed environments.

After completing this class, you will be able to:

- Articulate how to position UNIX, Windows NT, and even NetWare platforms within a corporate IT infrastructure
- Configure and troubleshoot TCP/IP interconnectivity to the network on UNIX and Windows NT
- Set up Telnet FTP and NFS in a mixed UNIX and Windows NT environment
- Understand the redirection of spool queues between UNIX and Windows NT
- Back up all servers in an integrated environment from a single utility

HP-UX and Internet Security

Security is important to everyone who keeps important and sensitive information on an HP-UX system. Over 90 percent of HP-UX security problems can be solved with attention to good user and administration practices. Connection to the Internet poses additional problems and dangers. This course focuses upon practical procedures that can strengthen the security of networked HP-UX systems. The security mechanisms of the UNIX system, in particular HP-UX, are explained with examples.

Who should attend:

People who are responsible for system and/or network administration and planning and design of security policies, and managers responsible for site security of networked HP-UX systems.

After completing this class, you will be able to:

- Improve the security of HP-UX systems at your site
- Recognize the signs of a break-in
- Detect hidden code that may have been added to your system by crackers
- Update your site policy with regard to HP-UX security
- Audit your systems for security problems
- Choose a safe means for controlling Internet access

In addition to the seminars, you'll also discover a world of HP-related information by attending the main conference sessions focusing on the following tracks:

- Operating Systems/Hardware Technology
- Networking Technology
- Database Technology
- Development Technology
- HP Computing Management

To register or learn more about HP WORLD '96 call 1.800.990.EXPO, 1.408.747.0227 or e-mail us at conference@interex.org.

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hp-ux/resource directory

The *hp-ux/resource directory* is a complete resource guide for HP-UX users seeking answers. This is one of the industry's most extensive reference guides for HP-UX products, services, and vendors. It will be devoted entirely to HP 9000 users operating in multi-user, workstation, and multi-system UNIX environments. This bi-annual directory, published each year in March and September, is a separate publication mailed out with *hp-ux/usr* magazine, the only HP-specific publication on the market.

Each company is listed by category, with each listing including company name, product, operating environment, and phone number. The cost for a full year listing in the *hp-ux/resource directory* is $475. Discounts are available for current advertisers in *hp-ux/usr*, *Interact* or the *Vendor Service Source Directory*. Advertisers who run more than one listing per issue also receive a discount. There is a 75-word maximum per listing, with a charge of $1.00 per word over the maximum.

Product Categories

Accounting
Accounting Software
Alphanumeric Paging Software
Application Development Software
Application Development Tools
Application Development Tools/4GL
Application Software Design
Backup Software
Bar Code Data Collection Systems
Batch Job Management
Books
Business Software
CD-R
CAD Software/Hardware
Case Tools
Change Management for Software Development
Change Management Tools
Client-Server
Communications
Communications Servers
Communications Software
Consulting
Consulting/Systems Integration
Customer Support/Help Desk Systems
Database Management Systems
Database Management Tools
Data Center Management
Data Warehousing
Decision Support Systems
Desktop Publishing
Diagramming and Flowcharting
Disaster Recovery
Distributed Computing
Distribution Resource Planning
Distribution Software
Document Management
Electronic Data Interchange (EDI)
Electronic Form Printing
Electronic Mail
E-Mail and Directory Integration
End-User Computing
Executive Information Systems
Facility Maintenance Software
Fax Automation
Financial
Forestry
Fourth Generation Language
GIS (Geographic Information System) Government and Utility Software
Graphics
Hardware
Hardware/Mass Storage
Hardware Subsystems
Help Desk Management
Human Resources and Personnel Systems
Image Processing
Image Storage and Retrieval Management
Input Devices
Industrial Terminals
Instrument Control
Integration Tools
Inventory Control
I/O Boards
Job Scheduling and Workload Management
Laser Printers
Laser Printing Software
Maintenance
Manufacturing
Manufacturing Software
Mass Storage
Mass Storage Peripherals
Memory
Memory Upgrades
Migration Services
Migration Tools
Modular Mass Storage
Multimedia
Network Backup Software
Networking
Networking Systems
Network Management
Operating System
Payroll
PC Compatibility
PC Integration
Performance
Performance Software
Personal Information Manager
Personnel Management
Pointing Devices
Power Protection and Conditioning
Print Management
Process Control Software
Production Planning
Project Management
Programmer's Editor
Protocol Converters/Interfaces-Hardware
Publications
Purchase Order Management
Quality Assurance Tools
Records Management
Rentals
Report Viewing, Printing, and Distribution
Report Writers
Sales and Marketing
Scheduling
Scheduling/Task Management
Security
Software
Software Development Tools
Software Distribution Tools
Software Maintenance and Testing
Spoolers
Spreadsheets
Statistics/Data Analysis
System Integration
System Management
System Management Tools
System Printers
3D Graphics Tool Kit
3D Porting Tool
Tape Backup Products
Tape Storage/Data Interchange
Technical Documentation/Cross Referencing
Telephone Management
Terminals
Terminal Emulation
Text Editors
Time and Billing
Time Reporting Terminals
Training
User Groups
Video/Keyboard/Mouse Extension
Warehouse & Distribution Management
Workstations

Other categories may be created as needed.

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hp-ux/resource directory

Fall 1996 Listing Form

	FIRST LISTING	EACH LISTING THEREAFTER	TOTAL
☐ Listing (includes two issues)	$475[1]	$375[2]	$_____
☐ Hyperlink to your home page[6]	$500	$150	$_____
☐ Company or Product Logo[3]	$100	$ 50[2]	$_____
☐ Product Photo[4]	$100	$ 50[2]	$_____
☐ Cross Reference[5]	$200	$200[2]	$_____

Total $_____

[1] *For current vendors who advertise at least 6 times a year in* hp-ux/usr, Interact, *the cost is $425.*
[2] *For current vendors who place more than one listing or who have a listing(s) in the* Vendor Service Source *directory.*
[3] *Maximum size that logo will appear is 3/4 inches high by 1-1/2 wide.*
[4] *There is a $75 charge for changing photos between issues. Photos must be submitted in either 35mm slides, 4x5 transparencies, or up to 4x6* ***Glossy*** *prints (black and white or color). The actual size of the photo in the publication will be 2-3/16" wide. The height will be determined by the orientation of the original photo (horizontal or vertical).*
[5] *A single listing can be placed in multiple categories for an additional charge of $200 per category.*
[6] *In addition to the listing in the magazine*

Drop Deadline: Friday, June 7th, 1996

(Please fill in all information completely—**ONLY** typed or legibly printed copy will be accepted.)

Category _____

Product Name _____

Operating Environment _____

Product Description (MAXIMUM 75 WORDS) There is a $1.00 per word charge for all listings over 75 words.
Please send your listing(s) to address below. Type or print copy on a separate sheet and attach to this form.

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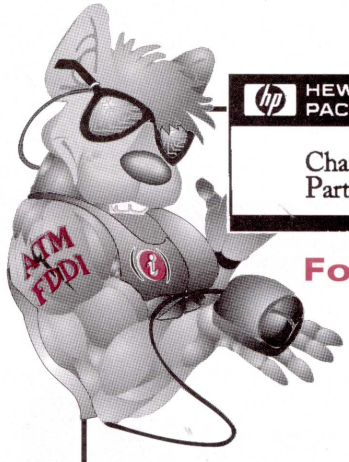

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